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SPECIAL COUNTRY REPORT

ARTICLES

Establishing Appropriate Best Practices in Intellectual Property Management and Technology Transfer in the United Arab Emirates: Building Human Capital, Global Networks and Institutional Infrastructure to Drive Sustainable Knowledge-Based, Innovation-Driven Development

Stanley P. Kowalski[*]

Abstract *For the United Arab Emirates (UAE), to sustainably build, foster, and sustain accelerated transformation towards globally networked knowledge-based, innovation-driven, economic development in the 21st century, a suite of internationally-standardized best practices (BP) in intellectual property (IP) management and technology transfer (tech-transfer) will be necessary. Appropriate BP are not only integral to national and international IP law, practice, and management, but, perhaps more fundamentally, are critical as the UAE seeks to forge strategic partnerships linking the private (e.g., small/medium enterprises: SMEs), government (e.g., funding sources), and public sectors (e.g., universities and research institutions), towards a dynamic nationally, regionally and globally interconnected innovation ecosystem. The importance of realizing the enormous, and indeed catalytic, potential which integration across these seemingly disparate sectors entails cannot be over-stressed, and the urgency of addressing this challenge must not be delayed lest evanescent opportunities evaporate. However, the key initial questions should be: What are BP for the UAE to establish and follow in order to make this happen? Who should develop and then make use of such BP- UAE IP professionals or*

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expatriate consultants and advisors? If UAE personnel (which it indeed must be) were to do this, then who should do this and how? This article addresses these questions in the context of building the human capital and institutional infrastructure in the UAE which will form the foundation for sustainable knowledge-based, innovation-driven development. It presents a candid appraisal of the current challenges that the UAE faces, the necessity to not only leap-frog from a petroleum-based to a knowledge-based economy but to catch-up in an ever accelerating, competitive, and unforgiving global IP/innovation economy, the role of IP management and tech-transfer expertise and requisite BP in this process, and the need to coherently and strategically implement a cultural transition in its citizens and institutions commensurate with this new century while recognizing the attendant risk, uncertainty, challenge, and opportunity.

I. UAE Background and Context

The United Arab Emirates (UAE), along with the other states comprising the Cooperation Council for the Arab States of the Gulf (hereinafter "*GCC*": Bahrain, Kuwait, Oman, Qatar, Saudi Arabia), is caught in an increasingly serious and urgent dilemma, between the predictable stasis of the latter half of the past century and the dynamic and disruptive shocks that will in all likelihood come to epitomize the coming decades of the current century. If one drills down deep enough, the question to ask is this: What is the core issue that encapsulates this disturbing dilemma? The answer is quite straightforward: it is the double-edged scimitar … the blessing and the curse of oil. The UAE increasingly and urgently needs to diversify from primarily being a commodity-based, petroleum (petrol) dominated, expatriate (expat) managed economy to a knowledge-based, innovation-oriented, UAE citizen driven economic system. In the GCC, the UAE is perhaps the leader in terms of, at least, recognizing the urgency for economic diversification and modernization, i.e., transition from hydrocarbons to knowledge and innovation as a foundation for national wealth and prosperity. (Light foot, 2014; Kane, 2015) However, can a transition from petrol to patents not only happen but occur at an unprecedented accelerated rate?

This challenge is common to all of the GCC countries, each of which similarly, albeit to a greater or lesser extent, recognizes (or at least appears to acknowledge) the looming urgency, and whose respective leaders thereby

pronounce broad, albeit vague, policy aspirations to "address". However, in order to clearly conceptualize the true urgency of the problem and then formulate a strategy that catalyzes sustainable development, a pair of quotes are apropos for framing and further expounding this dilemma. King Faisal of Saudi Arabia has stated, 'In one generation we went from riding camels to riding Cadillacs. The way we are wasting money, I fear the next generation will be riding camels again.' (Gylfason, 2000, p. 1) And, prophetically presaged by the Economist over a decade ago, the urgent truth this presents can neither be ignored nor bartered away with petrol riches: ' "The Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil." This intriguing prediction is often heard in energy circles these days. If greens were the only people to be expressing such thoughts, the notion might be dismissed as Utopian. However, the quotation is from Sheikh Zaki Yamani, a Saudi Arabian who served as his country's oil minister three decades ago.' (Economist, 2003) In other words, predominant reliance on a hydrocarbon/commodity-based economy is increasingly risky and unsustainable. The only viable path forward in this century is knowledge, information and innovation, as this article will illustrate.

Likewise, as with its neighbour Saudi Arabia, the UAE is in a precarious situation in its historical development. Decisions, investments, and commitments made in this decade will determine its future, well into the current century and beyond. Whereas this cursory analysis is beguilingly simple, the crux of the issue is far more complex: How can the UAE rapidly, strategically, and sustainably transform from a commodity-based to a knowledge-based, innovation-driven, globally-networked economy? More specifically, what are the necessary steps to establish a system of best practices (BP) in intellectual property (IP) management and technology transfer (tech-transfer)? This article will address this issue, and offer a systematic series of recommendations for accelerating the building of indigenous capacity and capability to affect and accelerate this crucial transformation in the UAE. It will provide a strategic approach towards implementing a system of BP in IP management and tech-transfer that is both appropriate to the challenges facing the UAE and sustainably enables and propels a methodical diversification and transition affecting the principal economic foundation of the country.

Accelerated diversification of a petrol-saturated economy to an innovation-driven system will neither be easy nor necessarily straightforward; yet it will come to epitomize a general principle in economic development across the globe, that is, the wane of the post-colonial era. This era is characterized by the decline of an erstwhile commodity/industry-based neo-mercantilism and the coincidental exponential expansion of the globalized knowledge-based

economy. IP plays an indispensably central role in this new economic order as the property rights system (the international IP rights (IPR) regime) is requisite for efficient protection, valuation, and transactions in the global innovation market. The urgency and importance of rapid economic, societal and legal transition is underscored by the paradoxical simultaneous confluence of the end of the oil age by mid-century, precipitated by an unrelenting collapse of oil prices, the ensuing wave of shocks, (Economist, 2016b, 2016e) and the sweeping global innovation and economic revolution. In the case of the UAE, the end of the oil age will likely not be due to wells running dry. Rather, a suite of green, alternative, and as yet undiscovered (and possibly unimagined) energy resources and related technological advances will be the major innovation juggernaut that undercuts and then replaces the petrol-based energy economy as we have come to know, rely on, and verily live and die by over the past century.

The paradoxical dilemma that the UAE must deal with is how to quickly engage in a global innovation market economy and strategically engineer the dramatic paradigmatic shift needed to make such a rapid and urgent transition? As intimated hereinabove, the unforgiving paradox is that the UAE must transition its economic system over to that which will end the very economic foundation that has nourished it and brought it to such a level of prosperity, comfort, and prominence to this day, i.e., innovation supplanting the global petrol energy economy while simultaneously being embraced by the UAE as its best strategy for sustainable development, transition, and survival in this century. Such a rapid economic transition is not unprecedented as the rapid disappearance of horse transportation at the turn of the last century attests. (The Economist, 2016e)

A. The UAE: Historical Context

The UAE has become both wealthy and impoverished on petrol. Over the past five decades petrodollars have built an impressive physical infrastructure out of the sun baked sand, perhaps no better exemplified than by the magnificently bizarre Ski Dubai. However, this wealth has come at a very high price: the societal impact of a petrol-wealth-saturated state has engendered a societal system that is fundamentally rentier and welfare-based, dis-incentivizing the citizenry into indolent passivity via a distributive, allocation-driven system of state operations, perhaps the very antithesis of innovation-driven, knowledge-intensive, globally-networked entrepreneurialism.

The much ballyhooed jargon, 'rentier economy' is used, and perhaps misused, in many contexts. However, as alluded to in this article, the term defines a paradoxical predicament that confronts the UAE, in that a suite of

benefits and entitlements negatively affect the motivation of UAE nationals to pursue education, career development, and the attendant risk of entrepreneurship. Could it be that the rentier economy is very antithesis of innovation-driven, globally-networked, knowledge economy? Why is it the case? What is the cause/effect nexus?

> A rentier economy is a special mindset that follows when there is a break in the causation between 'work' and 'reward.' If reward, say in the form of salary or status, is disconnected from the type or quality of the work being done or the effort that is put into it, and instead is related to luck (e.g. cash hand-outs or debt forgiveness, free housing) or proximity to people in power, then society provides the individual with very few incentives to work hard, pursue long and hard university degrees, or apply a long term perspective to climbing a career ladder. The disrupting effect of 'unearned money' on economies is frequently referred to as the 'Resource Curse' and …'the Arab Disease.' (Hvidt, 2015, pp. 37-40)

A major paradigmatic shift is necessary to overcome the inertia that the rentier mentality has infused and percolated throughout UAE society.

Indeed, as cautiously and cogently noted by Askari, Iqbal and Mirakhor (2014) 'The entrenchment of … open-handed welfare policies has posed challenges to development and economic reform in the [GCC] region.' Therefore, to prosper, diversify, and even survive in the coming century, the UAE needs to rapidly wean itself off the petrol udder, and dive into the world of innovation, with all the risk and opportunity that this entails. However, such a developmental process must not only be rapid but also qualitatively different from the precedential pattern as it occurred in the developed countries: 'over a period of centuries agriculture as the economic foundation of societies was succeeded first by industrialization, then by the so called "information society", and finally by the present "knowledge economy". The Gulf states have not – so far – been forced to invent nor to innovate, but have been able to base their development on learning or imitation; that is, by using their favourable financial situation to import technologies, know-how and manpower already available elsewhere.' (Hvidt, 2015, p. 24) The UAE cannot buy its way out of this dilemma; it must (verily in the truest sense of the term) develop its way out.

A brief summary of the past sixty years will provide a historical context that illustrates the complex challenge the UAE currently faces. Before the UAE existed, the region was inhabited by a deeply traditional tribal (e.g., Bedouin) society and later colonized by the British who in the mid-1950s

explored and then exploited the enormous oil and natural gas resources hidden beneath the scorched desert sands. Upon independence in 1971, the UAE, comprising seven ruling families (sheikhdoms) in the respective emirates, were founded. (Zemoi and Cervantes, 2009) This remarkable, and unique, federation of seven states (Abu Dhabi, Dubai, Ajman, Fujairah, Ras al Khaimah, Sharjah, and Umm al Qaiwain) has undergone astounding economic change in little over six decades. Originally, the UAE economy was dependent on the pearl industry, in addition to some agriculture, fishing, and artisans who hammered coffee pots or stitched sandals to wealthy pearl merchants and powerful Sheikhs; however, since the discovery of oil and the subsequent boom, the country's economy has transformed dramatically, from an unknown backward region to a globally envied jewel of prosperity. (Haouas and Soto, 2012; Al-Abd and Mezher, 2014; Birnhack and Khoury, 2016) That the UAE now seeks to accelerate, i.e., leapfrog, development towards a predominantly knowledge-based, innovation-driven, globally-networked economic system is an astonishingly (perhaps naively) ambitious and highly aspirational goal. In such an ultra-compressed historical time frame (six decades), the UAE is attempting (as are several of the other GCC countries)a paradigmatic feat historically unprecedented, i.e., to 'leapfrog directly from a pearling/fishing/trading economy into a knowledge economy.' (Hvidt, 2015) Put another way, in approximately sixty years the UAE would make the extraordinary economic transition from pearls to petrol to patents.

In light of this unusual historical context, it is quite, yet perhaps beguilingly, inspirational to read the laudatory, operative language of UAE Vision 2021. Albeit lacking in strategic formulation and tactical detail, Vision 2021, if taken seriously, suggests that developmental change is imperative and imminent:

> Innovation, research, science and technology will form the pillars of a knowledge-based, highly productive and competitive economy, driven by entrepreneurs in a business-friendly environment where public and private sectors form effective partnerships.
>
> We want the UAE to transform its economy into a model where growth is driven by knowledge and innovation. Productivity and competitiveness will come to rival the best in the world, as a result of investment in science, technology, research and development throughout the fabric of the UAE economy.
>
> Outstanding information and communication infrastructure will network our businesses together and give them a leading edge as they

> transact and interact with the world. Individual citizens will also reap the benefits of efficient connectedness in their digital lives as they search online for knowledge and the fulfilment of intellectual curiosity.
>
> This shift to a knowledge economy can only be accomplished within an entrepreneurial environment that harnesses the talent and creativity of Emiratis. A new class of entrepreneurs will be nurtured and supported with the help of practical programmes such as start-up incubators. In a national effort, the UAE will cultivate a healthy risk-taking culture where hard work, boldness and innovation are rightfully rewarded.
>
> Legal frameworks and government services will be designed to provide businesses with the efficient environment that they need in order to grow, thrive and commercialise innovative ideas. Regulations will promote efficient markets and protect intellectual property. Partnerships will flourish between the public and private sectors, spurring growth and maximising opportunities. The UAE will become one of the best places in the world to do business. (Federal Government of UAE, 2011).

However, upon reading this and then pausing for a second, one is left with several questions: How will this be accomplished? Who wrote this- a UAE national or perhaps a well-paid expat consultant? What is missing herein is the ultimate challenge, indeed a challenge far and above greater than even of constructing a Swiss-style ski resort in one of the world's hottest deserts, or even the tallest man made structure (Burj Khalifa). Manipulating vast amounts of reinforced concrete, glass panels, steel beams, plumbing, electrical conduits and extensive air conditioning and refrigeration infrastructure, albeit hard and demanding, involves *what is known and what is done*, and does not entail the excruciating fundamental transformation needed to sustainably effectuate UAE Vision 2021: accelerate a societal paradigmatic transformation from a highly localized, resource-based (perhaps cursed?), permeated-with-rentier-and-welfare activity system towards an entrepreneurial, innovative, information-driven, globally networked powerhouse. When viewed in this context, it is understandable that the focus had been on the (relatively easier) task of mega-construction projects. Not surprisingly, entrenched administrative inertia is likely also to be an obstacle: 'Physical infrastructures exist, funded by oil revenues, which can potentially enable this shift [towards innovation], but difficulties remain in terms of human resource development and highly bureaucratic nature of policy creation and enactment.' (Patrick, 2014, p. 243)

Notwithstanding that such an accelerated economic transformation would be hitherto virtually unprecedented in human history, i.e., from pearls to petrol to patents in less than six decades, the uncomfortable and inconvenient reality is that there is no viable alternative option for development. In the 21st century innovation will dominate global commerce, accelerating exponentially, where countries either catch up, engage, and win, or are left behind to become economic backwaters, or, even worse, failed states. (The Economist, 2017a) The GCC states have sadly done little substantively to 'prepare for a post-oil future. Now they must catch up.' (Economist, 2016b) Yet, in the case of the UAE, an intoxicating mix of petrol wealth and subsequent extravagance likely masks the reality that a resource-cursed, rent-seeking government management system might, actually, hamper sustainable development. (Zemoi and Cervantes, 2009, p. 8) Therefore, it is crucial that for such a dramatic shift to rapidly proceed and achieve sustainable success, it must be driven, led, and implemented by UAE nationals and not the cadres of highly paid expat professionals who have come to dominate the UAE private sectors ranks. These cadres, if relied on in this context, will be more a part of the enduring problem than a sustainable solution; in other words this is a distinct UAE challenge requiring directed and strategic UAE ownership and commitment, wherein the UAE builds the requisite human capital and institutional infrastructure to rapidly effectuate this urgent transition.

Furthermore, reliance on highly paid expat professionals extends to seemingly misguided partnerships with major western institutions, e.g., universities, which seek to somehow recreate in the UAE a level of innovation that is neither possible nor appropriate considering the UAE's current developmental circumstances. In sum, the process of paradigmatic transformation from the current rentier state (wherein a distributive/allocative system saturates and permeates) to a knowledge-based, innovation-driven economy must be in the hands of the UAE, its people, human capital, and institutional infrastructure, all of which is more daunting a task to rapidly build than might be an extravagant pseudo-city on Palm Jebel Ali. This indeed will entail attendant risks, obligations, focus and challenges (and shocks). However, courageously dedicated policy, clear strategy, and coherent, focused tactical implementation will catalyze success towards the transformation needed to move UAE Vision 2021 from aspiration to reality.

B. Ambitious Policy Aspirations of the UAE

The UAE's articulated aspirations regarding rapid transformation into a global knowledge-based, innovation-driven economic powerhouse are ambitious:

> The public policy agenda of Abu Dhabi Government for 2030, which represents the vision of the wise leadership of UAE President, H.H. Sheikh Khalifa Bin Zayed Al Nahyan, may God guard him, has been based on exerting ongoing efforts towards building a safe and coherent society as well as an open, sustainable and international competitive economy. This can be achieved through establishing a modern state, qualifying its citizens to face future challenges and building a knowledge-based economy, the key elements of which include innovation. Our wise leadership's awareness of the paramount importance of innovation, technology, research, creativity and leadership has been the luminous beacon for the Abu Dhabi Government and the beating heart for its sublime goals to focus on building and developing human capabilities and skills and providing them with the opportunity to embody the model of efficiency, innovation and excellence, build a human being capable of effectively contributing to progress and promote our beloved country to reach internationally advanced levels. (IKED, 2010, p. 4)

Whereas transforming a country and its society requires clearly articulated aspirations, these alone represent only a vague starting point. Policy, strategy, and tactical implementation, via clear and coherent action plans, must necessarily follow. Otherwise, lofty pronouncements predominate and proliferate with little, if any, sustainable impact. What is required then? According to the World Bank, a knowledge economy framework transition will necessitate 'sustained investments in education, innovation, information and communication technologies along with creating a conducive economic institutional environment will lead to increases in the use and creation of knowledge in economic production, and subsequently result in the sustained economic growth.' (Ahmed and Abdalla Alfaki, 2013, p. 86) In other words, to move from lofty aspiration to mundane implementation the grueling work of building human capital and institutional infrastructure is essential.

Perhaps to its credit, the UAE, likely more so than any other of the GCC countries, not only recognizes but is active in investing in program development vis-à-vis sustainable diversification (ostensibly/hopefully) towards a knowledge economy, appearing to recognize that human resource development must be a major priority in this process. (Ahmed and Abdalla Alfaki, 2013; Lightfoot, 2014; El-Khasawneh and Pech, 2015) Still, ambitious aspirations appear to abound, possibly overshadowing such sustainable development programs and related agendas, e.g., 'According to the Abu Dhabi Technology Development Committee, Abu Dhabi will be an Emirate in which the benefits of Science and Technology pervade every aspect of life;

empowering the Nation, transforming the economy, and inspiring the people.' (El-Khasawneh and Pech, pp. 507) This aspiration is variously reiterated, e.g., 'With its 2030 economic strategy, the Abu Dhabi authorities have committed to diversifying the economy, strengthening the role of the private sector, and fostering innovation and a KBE.' (IKED, 2010, p. 17)Abu Dhabi 2030 vision of his Highness Sheikh Khalifah Bin Zaid envisions that '64% of the total GDP will be from non-oil sectors and the oil effect on the GDP will just present 36%.' (Al-Abd and Mezher, 2014, pp. 121).

However, notwithstanding the confident and ambitious, albeit possibly misguided, optimism of official policy statements, such unrealistic aspirations are likely to face a challenge, i.e., the conundrum that implementation might require structural changes in the very foundations of society: 'While the UAE exhibits a strong innovation capacity base, particularly in accessing, anchoring and diffusing knowledge, its creation capabilities have significant potential for growth. In this regard, the UAE should continue to focus on input factors that will enhance its knowledge creation capabilities as well as its knowledge commercialisation and exploitation efforts.' (Mahroum, Alsaleh and Kanhere, 2013, p. 54).

Such exhortations stated, restated, and reiterated ad nauseam, provide little in the way of tangible strategic planning with clearly delineated objectives: How can BP in IP management and tech-transfer become integral to the UAE? That is, how can they be adapted in order to rapidly build a sustainable innovation/IP ecosystem? This conundrum has not escaped esteemed commentators: 'Assessing how Islamic communities respond to these challenges provides a unique case to examine how culture is affected by the adoption of Western educational ideologies and "best practices" in communities characterized by traditional socio-cultural norms and gender roles. And, it has significant consequences for the development of knowledge societies in Arabian Gulf countries given the inclination for knowledge economy and society development to be characterized by Western cultural and ideological assumptions.' (Wiseman, Alromi and Alshumrani, 2014, p. 4) Wiseman et al., however, offer a path forward: 'As a result, the challenges to creating an Arabian Gulf knowledge economy are twofold. One is a functional and structural challenge of developing a knowledge economy-oriented mass education system. The other is a cultural and contextual challenge of aligning Arabian Gulf expectations, traditions, and norms with those of knowledge economies.' (Wiseman, Alromi and Alshumrani, 2014, p. 2) Therefore, as this article elucidates, strategically building a system of BP must balance the inner cultural with the global developmental dimensions. This can only be carried out by the citizenry of the UAE, i.e., all of the

people … especially the young, (Hvidt, 2013) with women taking an active and dynamic leadership role.

II. Challenges Complicating the UAE's Development

The urgency for rapidly transforming the UAE towards becoming a global innovation leader is counterbalanced by a series of serious and palpable challenges, which can be broadly categorized as cultural, societal, economic, and political. Although these categories are neither absolute nor all encompassing, and admittedly there might be a cross-over conceptually, they are presented thus herein to merely organize a very complex topic and illustrate that the road from pearls to petrol to patents is unpaved, unmarked, and unmapped: a largely an unknown risky passage, as was the New World voyages of the resolute Conquistadores in past centuries.

Furthermore, in the context of challenges towards becoming a knowledge economy, it is important to remember that IPR and IP law must always be viewed in the context of a country's stage of development. Therefore, this article seeks to present a context for BP applicable to the UAE, i.e., on the role of law in enabling the efficient operation of an innovation system: the effective use of IP law towards IP management and tech-transfer in order to accelerate innovation. As an analogy, in most developing countries, IP in the context of development might be compared to a series of traffic lights and laws, with neither a road network, cars, nor even people who know how to drive; only after the roads (infrastructure), cars (tools), and capable drivers (human capital) are in place will the laws and traffic lights have a context for useful operation, as law does not exist in a vacuum, but in a dynamic system. Likewise, IP law needs to be conceptualized in a larger systemic context, addressing challenges and building capacity, capability, and institutional infrastructure to operationalize IP law so that it facilitates efficient and sustainable IP management and tech-transfer, whether local, regional or global.

The challenges, in general, hindering the efficient establishment of an appropriate and efficient system of BP in IP management and tech-transfer in the UAE include (yet are not necessarily limited to) (Modarress, Ansari and Thies, 2014, p. 119):

- Lack of innovation capability;
- Low female participation in the workforce;
- Inadequate UAE nationals with the skills demanded by the private sector;

- Excessive national reliance on government support;
- Increasingly precarious economic overreliance on hydrocarbon exports;
- Weak convertor industries, i.e., lack of robust triple helix;
- Shallow cluster of R&D;
- Bureaucratic management and a lack of transparency in government; and
- Societal instability due to the disproportionately high ratio of foreign labor and income inequality.

A. Engaging the Global Knowledge Economy

For the UAE to rapidly undergo a transition from its current, largely petrol-based, economy to a knowledge-based economy is not only ambitious, but also somewhat vague. As has been oft pointed out, the term 'knowledge economy' has certain degree of tautology, i.e., can be jargonish, ambiguous, and/or abstract. (Patrick, 2014, p. 237). It might therefore be prudent to proffer an elucidation for what the term 'knowledge-based economy' means in the context of this article. Then only, an appropriate organization and discussion of IP management and tech-transfer BP can be presented in a framework that is logically coherent.

Various definitions of knowledge-based economy have been proffered:

> The World Bank had defined knowledge-based economy as: '[T]he knowledge economy … meaning is broader than that of high technology or the new economy, which are closely linked to the Internet, and even broader than the often-used information society. Its foundations are in the creation, dissemination and use of knowledge. A knowledge economy is one in which knowledge assets are deliberately accorded more importance than capital and labor assets, and where the quantity and sophistication of the knowledge pervading economic and societal activities reaches very high levels.' Note: the same source considers four pillars for a knowledge-based economy, which are the main framework that guides analysis in the current paper, i.e.:

1. information and communication technology
2. education
3. innovation

4. economy and regime (which includes IP system) (Parcero and Ryan, 2016, pp. 2-3)

As this century unfolds, knowledge, and related intangible assets, will increasingly become the 'key driver of productivity and economic growth, thereby departing from the traditional emphasis on the accumulation of physical capital [e.g., petrol]. In this regard, knowledge refers to the cumulative stock of information and skills involved in connecting new ideas with commercial values, developing new products and processes, and therefore doing business in a new way.' (Mahroum, Alsaleh and Kanhere, 2013, p. 11) This will entail a rapidly emerging global innovation marketplace where innovation drives an accelerated, seemingly exponential, technological evolution of 'innovation with new products and processes that develop from the research community (i.e., R&D factors, universities, labs, and educational institutes).' (Hvidt, 2015, p. 27) In order to engage with this challenging economic reality, emerging economies need to leapfrog ahead with both capable human capital and capacitated institutional infrastructure, lest they be left behind in the oil bin of history.

Therefore, fundamental to the concept of knowledge economy is the effective and efficient utilization of intangible assets, such as knowledge, skills, and innovative potential, applied and implemented towards competing in the rapidly emerging global economy. (Hvidt, 2015, p. 28) Critically noteworthy in this regard is the role of IPR, beyond the narrow paradigm of protection of IP, i.e., to the broader more dynamic vision of IPR as the legal property system which lowers transactions costs and thereby accelerates the movement of technology and innovation. In this regard, 'The output of a knowledge economy would consist of knowledge products, such as trademarked or copyright processes, and technologies …[K]nowledge products and ideas need to be protected as a form of property if they are to operate within competitive capitalist societies.' (Weber, 2014, p. 61) And, to take this concept to the next step, i.e., from IP protection to use, requires fundamental changes in terms of paradigms, perceptions and practice: 'In general, changing the IP-related environment and phenomena … suggests a need for IP systems to evolve further from an institution to protect IP to one that fosters more use of IP.' (Lee et al., 2013, pp. 39)

In the globalized knowledge economy of the 21st century, what are the essential components, i.e., the nuts and bolts? In other words, the industrial economy has been built on a tangible infrastructure of steel, glass, reinforced concrete and petrol, but what about the knowledge economy? Certainly data, information, and knowledge are fundamental, but, as Patrick has pointed out, the person as the knowledge worker is the key: 'It is not just knowledge

that becomes commodified in policy and practice, but the person in the form of the knowledge worker.' (Patrick, 2014, p. 239) However, Patrick continues by questioning whether Arabic cultures can readily adopt the new ways of thinking, working, and networking, essential in a knowledge economy, such as teamwork, open communication, and autonomous learning. How can a balance be reached wherein the demands and suite of knowledge, skills and abilities of a globalized innovation culture are adapted yet in harmony with localized culture and custom? The UAE will likely need to carefully consider this issue as it invests in its own human capital resources. The new generation of knowledge workers must be capable, proactive, and enthusiastically committed to contribute to economic development, and not simply become a next generation of 'largely passive individual[s] who will simply adopt new ways of thinking and working.'(Patrick, 2014, p. 239)

Fostering this human capital requires an integrated/interconnected innovation system, the essential platform from which a knowledge-based economy can be built. Such a system includes a network of professionals, small/medium enterprises (SMEs), public and private institutions, as well as the laws, rules, and regulations that foster the dissemination and use of knowledge and technology towards sustainable economic transition and growth. IPR, as a legal foundation, and IP management and tech-transfer as a means to actualize IP BP, will accelerate and maximize efficiency in this innovation ecosystem. (Abdalla Alfaki and Ahmed, 2013, p. 9) 'Knowledge-based development requires a holistic approach that brings together researchers, entrepreneurs, and policymakers. Connecting scientist and researchers with entrepreneurs in clusters, networks, and regions is an essential ingredient for an innovation ecosystem.' (Tadros, 2015, p. 5) A proper system of education is the rock-solid foundation upon which to build an innovation ecosystem. Neither free nor easy (although a knowledge economy is primarily composed of diverse intangible assets, these do not magically materialize gratis), this will require investments in education, research and development (R&D), including capacity building and collaborative research, entrepreneurship, and commercialization of appropriate innovations and technologies with global marketing strategies. (Tadros, 2015, p. 4) A crucial initial question is what might constitute a hub, a catalytic center that focuses a critical mass of talent, expertise, and knowledge to rapidly and sustainably drive the transformation? And in the case of the UAE, how to establish, should it one day face the exigency of a departure (possibly sudden) of expat expertise?

The current situation in the UAE is characterized by a systemic inadequacy that, if not strategically addressed and managed, could spell failure in the longer term. The UAE cannot buy its way out of this challenge;

it must transform its way out and then accelerate forward. Currently the UAE is hobbled with an economic and social order that can, to a discernible degree, be described as distributive, rentier and welfare, due to the mixed oil-cursed blessing of opulent wealth. However, it must realize that building a robust, sustainable knowledge economy necessitates an entirely new dynamic paradigm, as contrasted with the petrol-soaked paradigm of a pervasive and perverse yet comfortable and beguiling world of disincentives, security, and somniferous complacency. The challenge, therefore, is to avoid being left behind, verily to leap-frog across the chasm of development. To build a knowledge-economy, education cannot be static, stale, or traditional (i.e., rote learning and memorization … the late, esteemed philosopher and educator, Dr. Mortimer Adler going so far as to describe such education as producing cadres of 'educated ignoramuses'); in order for it to be part of the solution, and not part of the problem, education must promote entrepreneurial drive, innovative thinking, critical analysis, active learning, and most importantly risk taking. The acceptance that failure is not catastrophic but part and parcel of the dynamism of the innovation ecosystem is the key. Such an educational system is iterative and self-reinforcing, feeding back to advance development and competitiveness and stimulate interest and catalyze networks among students, educators, policymakers, entrepreneurs and employers. (Kirk, 2014; Hvidt, 2015).

B. Cultural Challenges

From a cultural perspective, it is primarily important to understand and appreciate the rapidity of the UAE's development. A sensitivity and respect for the cultural paradigm must, therefore, be balanced against the unforgiving reality of the emerging global knowledge-based economy and the necessity to either engage in the global innovation market or risk being left behind. In this regard, three possible avenues have been suggested for an Arab approach to the inexorable juggernaut of globalization:

1. those who reject it as the highest form of cultural imperialism which serves to undermine their local traditions and cultures;
2. those, mainly secular individuals, who welcome globalisation as a force for modernisation, which brings the age of modern science, advanced telecommunication and freedom of choice to their conservative homelands; and
3. those who believe, pragmatically, that it is possible to find a form of globalisation which is compatible with local cultures and beliefs. (Light foot, 2014, p. 87)

The current educational system presents a somewhat daunting challenge. In the GCC region, 'Islamic education traditions have little to do with theories of human capital formation, but much more to do with the establishment of social conformity in line with the Quranic teachings.' (Light foot, 2014, p. 98) It might, therefore, be argued that the development of a national knowledge-based economy and globally networked innovation-system should be in congruence, and not in conflict with a 'dynamic intersection between religious ideology, economic development, and educational infrastructure, which are defining characteristics of the "Gulf State Phenomenon"'.(Wiseman, Alromi and Alshumrani, 2014, p. 19).

As currently established, the educational system in the UAE (characterized with obsoleteness) fosters an indigenous workforce which is ill-prepared to drive innovation based development. From preschool to university, '[T]eaching in the Arab world tends to emphasise rote learning rather than developing analytical skills.' (Economist, 2016a) With a labor market that is significantly segmented by sectors, compensation, and skills, over 90 percent of the UAE nationals are employed in the public sector, i.e., governmental, with wage and benefit packages that rival those of expats similarly positioned. (IKED, 2010, p. 18-19) Whereas this employment demographic provides security and stability to many in the UAE, it might not be sustainable over the next several decades (e.g., with youth unemployment alarmingly increasing). Yet, the challenge of economic diversification, wherein UAE nationals assume leadership and risk, will necessarily involve 'widespread cognitive and attitudinal shift …through the process of indigenization'. But when 'individuals [continue to] look to be ruled, told, guided, and provided for, this expectation militates against the changes in individual outlook needed for a shift towards a knowledge based society: autonomy, critical thinking, innovation, tolerance for ambiguity, and resilience to the unpredictable nature of knowledge creation and innovation.' (Patrick, 2014, p. 247) Hence, there is a seemingly paradoxical, paradigmatic dilemma for the UAE government and national education system to address: to build appropriate human capital that can engage in the exponentially expanding global innovation market. (Wiseman, Alromi and Alshumrani, 2014, p. 7).

C. Societal Challenges

From a societal perspective, UAE nationals have become somewhat jaded from a monetary windfall that followed the hydrocarbon commodity boom of petrol in the middle of the last century; they live in a comfortable distributive society, with a governmental focus on consumption and sharing, congruent with the 'elaborate welfare states in all Gulf states, encompassing free

healthcare, schooling, generous pensions, etc.' (Hvidt, 2015, pp. 37-40) A subsequent flood of wealth fostered a sort of societal 'evolution' that is premised on a preponderance of cash in perpetuity, understandably an unsustainable proposition given the dynamics of the 21st century. This is exemplified by the fact that the 'UAE is an extreme welfare state when it comes to the treatment of its own nationals. Emirate males receive over $55K per year in total transfers. Not surprisingly then, the country faces a lack of incentives typical in welfare states.' (Parcero and Ryan, 2016) However, an incipient crisis looms: 'the distributive model has run out of steam, and it has left the economies in the region under significant stress.' (Hvidt, 2015, p. 25)

Yet inertia persists; for example, employment and careers are largely incompatible with creation of a knowledge-based society, i.e., 'the fact that … Gulf national[s] prefer high status, high job security, and guaranteed payment like that offered through the public sector. Therefore, the most frequent employment for [GCC] nationals has been in the public rather than the private sector.' (Wiseman, Alromi and Alshumrani, 2014, p. 15) Despite governmental efforts to the contrary (such as Emiratization programs for the private sector), this persists in the UAE. (Parcero and Ryan, 2016) Such a social system is, at best, disincentivizing, and at worst, crippling (inimical to knowledge-based development). '[T]he public sector has to stop acting as the main employer. That would be a big shift. Gulf citizens have got used to earning without doing much.' (Economist, 2016b) In addition, this has also created a sort of perverted elitist expectation and stratified status within society, wherein 'attitudes and expectations about which kinds of jobs are appropriate have formed among Gulf nationals.' (Wiseman, Alromi and Alshumrani, 2014, p. 12) A combination of expectations and entitlement has therefore created an environment of inertia and morass, with a troubling societal paralysis. Official proclamations, albeit comforting in the short term, require commitment and strategic investment. "Diversification, long talked about, has to happen now.... Plans look good on paper …but more uncertain in real life." (Economist, 2016b)

The beguiling sense of security that permeates the current societal/cultural environment in the UAE is, at best, pleasantly illusory, and, at worst, ominously dangerous. For the young of the UAE this environment fosters weakness, lack of stamina, and diminished ambition, along with an entire spectrum of disincentives ranging from educational goals to career development ambitions; furthermore, this weakens the link between the education sector and the innovation market, fueling a downward spiral that feeds upon itself with a chronic institutionalized misallocation of human capital that ultimately stymies sustainable economic growth. A shift is necessary,

which might require a sort of shock therapy in order to rapidly overcome the 'significant challenges related to motivating the national population to pursue knowledge through education, engage in innovative activities, and participate in, claim ownership of and actively involve themselves in the knowledge economy.' (Hvidt, 2015, p. 37) Therefore, this endemic lack of motivation (particularly among the youth) must be overcome swiftly to overcome extraordinary challenges, that is, to implement and actualize, in little over a decade, the aspirational policy proclamations of the UAE government to transform UAE into a major innovation-driven economy.

D. Economic Challenges

From an economic perspective, intimately related to education, is the pervasively negative impact that the petrol/hydrocarbon natural resource economy afflicts on knowledge based development. This relationship, repeatedly articulated by numerous commentators, is perhaps best summarized by Gylfason:

1. Economic growth varies inversely with natural resource abundance.
2. Three different measures of education intended to reflect education inputs, outcomes and participation are all inversely related to natural resource abundance.
3. Economic growth varies directly with education.

Therefore, natural resource abundance seems likely to deter economic growth not only through the Dutch disease, rent seeking and overconfidence that tends to reduce the quality of economic policy and structure …but also by weakening public and private incentives to accumulate human capital. (Gylfason, 2000, p. 7)

In addition, whereas this hydrocarbon economy fosters 'traditional' education, capacity-building educational initiatives, towards accelerating the development of a knowledge-based economy, are conversely disfavoured. In other words, the greasy slog of petrol creates a viscous inertia in the entire educational enterprise.

More eloquently elucidated by Hvidt, 'natural resource abundance and educational levels are inversely related because abundance of resources – if not controlled properly – leads to high levels of non-wage incomes, and as such reduces the private and public incentive to accumulate human capital.' (Hvidt, 2015, pp. 37-40) This perpetually unfolding and downward spiraling economic predicament is ironic in that the very capacity building initiatives

needed to launch out of the petrol/commodity based economy are, in fact, stymied by the viscous economic morass that permeates society. Whereas laws and business climate are important, they are insufficient; significant and strategic investment in education and know-how is critical and key. (Haouas and Soto, 2012, p. 33)

As the global innovation economy continues to expand, the urgency of change likewise increases. The challenge to connect to the global innovation economy will be key. To do so requires acceptance of international rules, standards, business practices, networks and acumen, which absolutely include capacity and capability in IP management and tech-transfer, with related expertise and BP. For the UAE, there is no turning back, no stasis, only forward into this century: 'International competition and interdependence create a common community in which all nations participate, willingly or not. Nation-states cannot compete with others that do not acknowledge their status within this community. The importance of inclusion in an international economy suggests the need for legitimization within a global community.' (Wiseman, Alromi and Alshumrani, 2014, p. 18)

Still, in the context of the GCC countries, the UAE might be in a better position to make the transition to a knowledge-based economy than most of the others. In its most egregious manifestations, the oil curse (also called the resource curse …some even calling oil 'the Arab Disease.', Hvidt, 2015, pp. 37-40) is when hydrocarbon capital crowds out of capital resources crucial for subsequent knowledge-based development. However, the UAE's progressive governmental policies have promoted investment in 'the institutional fabric that deals with the working of the private sector (rule of law, corruption control, etc.).' In spite of this, the UAE government must continue to make concerted, strategic efforts to overcome the impact of oil rents. (Haouas and Soto, 2012, p. 34) Paramount among these efforts is building human capital that will effectively connect to, engage with, and compete in the global innovation/IP marketplace. This cannot be done by well-paid expatriates; ultimately, they are an obstacle, part of the problem and not the solution. 'Addiction to cheap foreign labor, including expatriate knowledge workers, are serious barriers to the creation of a knowledge society.' (Weber, 2014, p. 80)

In a sense, the UAE is exemplary of countries that, although investing significantly in various input factors supporting innovation, still do not generate high levels of innovation, e.g., patents, know-how (trade secrets), scientific publications. (Mahroum, Alsaleh and Kanhere, 2013, p. 51) Furthermore, a good indicator that a country has taken knowledge into the production sphere is when knowledge/innovation 'products' comprise an important

component of the country's exports; the UAE performs quite poorly as an exporter of high technology. (Parcero and Ryan, 2016, p. 13) The question to ask at this junction is - why, in spite of investments physical and infrastructure, the UAE still lags in terms of becoming a knowledge-based economic power? To a great extent this is because the UAE is still not building the requisite human and institutional capacity and capability to become the much aspired for innovative power that its leadership envisages.

E. Political Challenges

As has occurred repeatedly, and sadly, from a political perspective, the mixed blessing/curse of oil more often than not fosters misguided 'development' priorities, pervasive wealth inequality (also known as the wealth gap … which refers to the unequal distribution of hydrocarbon-derived assets), and a consequential retardation of anything resembling a knowledge-based, innovation-driven economy. 'Rarely have developing countries used oil money to improve the lives of the majority of citizens or bring steady economic growth. More often, oil revenues have cause crippling economic distortions and been spent on showy projects, weapons and Paris shopping trips for government officials.' (Gylfason, 2000, p. 1) In the case of the UAE, 'evidence suggests that resource-rich countries show a tendency to implement large-scale projects without significant collaboration with private enterprise …' (Mahroum, Alsaleh and Kanhere, 2013, p. 54) Ski Dubai is perhaps the most egregious manifestation of this sort of short-sighted 'strategic' trend in capital asset misallocation.

In general, therefore, the GCC countries are currently encountering a somewhat precarious predicament of promoting principles and values that foster knowledge-based economic development while maintaining political systems and order that have persisted since the pre-petrol economies emerged in the middle of the last century. Such a cautious approach might also be inimical to rapid transformation towards a sustainable innovation-driven economic engine. The dilemma is ubiquitous, essentially pitting past against future, with very high stakes: 'The rulers of the Arab Gulf states find themselves in a difficult position in this regard: they are keen to promote and develop their knowledge economies, as outlined earlier, but they find it hard to reconcile this new freedom of ideas and openness with a forms of government which at best could be described as constitutional monarchies, but in many ways are conservative, traditional, tribal, patriarchal and often authoritarian.' (Light foot, 2014, p. 95)

The oil-induced 'Arab disease' has fostered a dangerously comfortable inertia, not unlike resting on a bed of roses as the petals slowly wilt and

one gradually descends into the treacherously spiny thorns. The misguided overconfidence in the sustainability of the petrol economy in the GCC resource rich states, e.g., the UAE, has caused these countries 'to underrate or overlook the need for good economic policies as well as for good education. Indeed, resource-rich nations can live off their natural resources over extended periods, even with poor economic policies and a weak commitment to education. Awash in cash, they may find that education does not pay.' (Gylfason, 2000, Ex. Guide) A spiral ensues, wherein wealth promotes overconfidence which generates inertia that stymies incentives and quashes education. This establishes a feed-back cycle that reinforces petrified political progress and increasingly obsolete economic policy and strategy, i.e., inimical to solid knowledge-based economic development: forever fossilized in the past century's seemingly endless petrol-fueled prosperity.

F. The Problem with Petroleum: Economic Diversification

Despite policy pronouncement to the contrary, the UAE continues to be strongly dominated by hydrocarbon activities, which contribute to its continued economy wealth and prosperity. This is entirely understandable, e.g., 'boasting 8-10 per cent of the world's known oil resources, Abu Dhabi will retain the benefit of a solid economic bulwark, which can be relied upon to produce substantive revenues for many years to come.' (IKED, 2010, p. 17) Yet, this is neither a sustainable nor a sensible economic policy.

The dominance of the natural resource, hydrocarbon commodity-based economy not only perpetuates but in fact contributes to and fuels under performance in innovation. 'Analysis of factors crucially hindering innovation further identifies eight gaps that require policy action:

1. Low economic diversification;
2. The turnover of expatriates;
3. Weak ties among talented individuals belonging to different organizations;
4. Absence of an environmentally sound and sustainable economy and society;
5. Weaknesses in opportunity-based entrepreneurship;
6. Under performance in R&D and technical innovation;
7. Mobilization of human resources and investments to match opportunities for economic and business development, and;

8. Weaknesses in governance.' (IKED, 2010, p. 9)

Although likely recognizing that the historical burden of this precedent weighs heavily against it, the UAE nevertheless aspires to be an exception to the prevailing reality that … 'oil economies have been largely unsuccessful in transitioning beyond natural resources and into more sustainable industries. This is, in part, because oil abundance is associated with low levels of human capital formation.' (Ewers, 2013, p. 128)

The flow of petrol and wealth has been an intoxicating boom, and data unambiguously support the proposition that the hydrocarbon economy continues to prevail and dominate the UAE. Put into blunt perspective, the trend which creates such wealth continues to copiously flow forth and, to a certain degree, continues to smother incentives towards realizing serious investment in programs that will generate sustainable indigenous human capital and institutional infrastructure, so sorely needed for transition to a knowledge-based, globally-networked economy. With a per capita income of approximately $24,000, it is informative to note that between 2003 and 2007, UAE oil revenues almost tripled, from $23 to $63 billion, i.e., 33 per cent of GDP in 2007. Yet, despite policy initiatives and calls for diversification, oil exports still dominate, accounting for approximately 35% of the UAE's federal budget. This has been deeply entrenched in the economic structure of the country for decades, e.g., 'between 2000 and 2005, oil and natural gas provided 66% of the UAE's fiscal revenue.' Blessed (cursed?) with one of the world's largest reserves of oil and natural gas (214 trillion cubic feet of proven natural gas reserves), the UAE possesses the sixth largest proven oil reserves on planet earth, at 98 billion barrels, that is, 8% of the global total.(Lugar, 2008, pp. 75-77) This paints an oily picture: putting the economy of the UAE and calls for innovation-based development into ominously stark perspective, i.e., a 'lack of innovative activities and inability of the UAE economy to assimilate and create new knowledge and technologies that cater for domestic needs.' (Abdalla Alfaki and Ahmed, 2013, p. 9) Amelioration cannot be achieved via reinforced concrete, steel and shiny, indeed palatial, new buildings, which unfortunately appear to be commonplace throughout the GCC region:

> Diversification is important to most Natural Resource Rich Economies (NRE). Such economies tend to develop an excessive dependency on their natural resource base while, at the same time, they possess significant financial resources to support new sectors. In the GCC countries, substantial oil revenues have been re-invested not only in large-scale infrastructure projects, but also in the creation of science and technology parks, innovation incubators and the development

> of clusters. Despite the demonstrated zeal and tangible results seen in several such undertakings, hurdles and challenges remain when it comes to laying the foundation for innovation-led long-term sustainable economic growth. (IKED, 2010, pp. 18-19)

It is perhaps far easier to pour concrete, raise steel, assemble ironwork, and raise skyscrapers than to rapidly generate entirely new priorities and values in societies that thereby generate new systems; even easier to build glitzy techno parks than to forge a new paradigm in the national psyche. The magnificent, albeit astounding absurdity, of the indoor sky resort, Ski Dubai, both illustrates this and cautions us: Investing in physical infrastructure is much easier than building human capital and institutional infrastructure, and verily is a woefully sorry substitute therefor.

For the UAE, leapfrogging, that is, jumping over an entire stage of development is unprecedented, as the UAE did not undergo developmental phases that the industrialized countries have (from agrarian to industrial to innovation). Enormous oil revenues have accelerated wealth accumulation and shortcut to a path of 'economic development'. (Erogul and Horne, 2014, p. 186) Having bypassed an industrial phase may have had its advantages, yet as with massive wealth in general, this also entails enormous weaknesses and deficiencies. Closing the gap towards becoming a knowledge-based, globally-connected innovation economy might also be complicated if not severely compromised. (Hvidt, 2015, pp. 44-45)

Considering that the pace of global innovation's exponential acceleration is inextricably coupled with an ever-increasing need to engage in this complex global innovation marketplace in order to survive, delays towards strategic transformation in the UAE portend an ever widening gap, with a concomitant ever greater distance to leapfrog, i.e., conceptually from a cranny to crevasse to chasm as time passes and the pace of global innovation accelerates. This is even further exacerbated by the reality that innovation is now less about individual genius inventors laboring away, patenting, and thereby generating value and wealth, but is now driven by the identification and assembly of innovations, technologies, and appurtenant IPR, i.e., the open innovation paradigm. (Chesbrough, 2003; Granstrand and Holgersson, 2014) For a developing or emerging economy such as the UAE, an unflinching acceptance and understanding of this 21st century reality requires a new and brutally objective change in view, i.e., a paradigm that must be embraced in order to leapfrog, verily vault, over the industrialization phase.

> [T]he Gulf States are attempting to leapfrog over the industrial phase and proceed directly to the knowledge economy. The effect of that, it can be hypothesized, is that the Gulf States most likely lack the production-oriented experience, skills, and work-related discipline pertaining to the industrial age in establishing their knowledge economies. Stiglitz points out that the scientific orientation on which the industrial phase is founded also has an important bearing on the ability to proceed to a knowledge economy: 'The scientific revolution of the past century has resulted in the systematization of change itself: the very process of producing new innovations has been altered, from isolated and independent inventors like Thomas Edison to huge research laboratories. Knowledge and information is being produced today like cars and steel were produced a hundred years ago.' (Hvidt, 2015, p. 43 (quoting Stiglitz))

G. Urgency

The urgency of the UAE's serious commitment to innovation-based development is glaringly apparent when one considers that the accelerating global innovation economy entails both beneficial and potentially catastrophically disruptive innovations. (Al-Filali and Gallarotti, 2012, p. 2) Innovations will bring significant changes to the market for energy, undercutting and further altering the already fragilized, oil price-shocked global petrol energy economies, e.g., unexpected, highly novel advances in energy production. This concept of 'disruptive innovations' is not historically unprecedented; it is the fabric of the story of humankind. To paraphrase what was articulated hereinabove, the stone-age did not end for want of stone. '[T]he development of new and feasible technologies for energy have the potential to drastically change conditions in the market for oil.' (Al-Filali and Gallarotti, 2012, p. 2)

Hence, the central irony that petrol states must become innovation-driven because of the ever-looming specter of disruptive innovations becomes even more apparent; for example, disruptive innovations in the energy sector could rapidly and drastically undermine the petrol market, just as petrol had undercut the whale oil market in the late 19th century (Beaton, 1955), and automobiles undercut the centuries old horse-based transportation in the early 20th century. (The Economist, 2016e) And whence might such disruptive energy innovations arise? Perhaps from the greenery that surrounds us all - plants. That is, the invention of a revolutionary catalytic, bio-based, renewable water splitting technology that harnesses the very enzymatic and energetic processes of photosynthesis as a power supply for bio-hydrogen

production. One can only imagine the vast disruptive impact such would have on the global energy economy. (Esper, Badura and Rögner, 2006)

It is not a question of if the change is coming but rather when it will hit, not whether it might occur but rather that it will happen: it is coming and the UAE must prepare for proactive engagement in this global IP/innovation economic dynamo or risk being run over and left behind in the dust of history. In chronicles yet to be written, the UAE might be nostalgically remembered as that glittering, albeit evanescent, mirage in the vast sands of the Arabian Desert, which, in little more than a century, waxed triumphantly, and then waned tragically into failure … windswept buildings, lost opportunity and possibly even greater tragedy and sorrow. (The Economist, 2017a)

Any current sense of security that is present in the UAE can only be objectively viewed as short-term: whereas there appears to be time, there really is not, and whereas it appears that its wealth will serve as an economic prophylactic, it might be to the contrary. For example, the UAE might arguably be better situated than other GCC countries, but that is not saying much, as it is a matter of being better positioned in an overall precarious geographic instability of the highly volatile Persian Gulf and global economic uncertainties of petrol. The UAE as the miracle in the desert could rapidly, in a matter of decades, become the nightmare in the sand, just as so many abandoned mining boom towns litter the deserts and parched prairies of the American West, populated by grass, geckos and ghosts. In other words, 'Despite innumerable warnings and innumerable failed attempts to diversify … away from oil … it is still only a matter of time before the crunch comes.' (Economist, 2015)

Accelerating establishment of a robust and dynamic knowledge-based economy involves 'enterprise development and entrepreneurship (including SMEs, start-up rates, risk-taking and venture capital functions)', not only connecting to international markets and integrating in global value chains (IKED, 2010, pp. 18-19), but also investing in the human capital and institutional infrastructure that will facilitate sustained momentum and growth in an increasingly globalized and competitive innovation marketplace. A systematic and strategic approach is warranted: 'The process for building a regional innovation system (RIS) in three stages: (1) realise a cluster of innovative firms in a specific area; (2) create and/or reinforce a set of knowledge institutions; and (3) implement social interaction mechanisms among firms and universities that allow the generation of the interactive learning process.' (Ewers and Malecki, 2010, p. 501) Whereas appearances of current initiatives might suggest otherwise, it is, at least, questionable whether these stages are in fact manifest in the UAE. For example, Masdar's Innovation and

tech-transfer office (TTO) are still nascent. What is missing? Perhaps making the global connections necessary for true integration into the IP-driven innovation market, coupled with a continuing lack of local expertise, i.e., an incomplete metamorphosis that is more cosmetic than substantive, the transition from petrol to patents is still spinning wheels in the oily sand.

III. The Imperative: Knowledge-Based, Innovation-Driven Development and the Global Innovation Market

The challenge that confronts the UAE is that of leapfrogging from oil to innovation. However, this is a much broader construct of the term 'innovation', as it is largely understood: 'Innovation, whether it is undertaken internally or externally, is a complex process which often involves knowledge flows … and hence requires knowledge absorption and learning. The innovation-value creation process is viewed as systemic, i.e. [organizations] do not innovate in isolation but do so through a complex set of interactions with external actors.' (Mahroum, Alsaleh and Kanhere, 2013, p. 12) In the UAE, the complexity of leapfrogging is, at its heart not an IP question, but rather a broader economic development issue: albeit a key component of the overall innovation system, IP is not, per se, the innovation system; it establishes the rules, regulations, and tacit understanding that fosters trust, enables arms-length licensing, lowers transactions costs and in so doing accelerates the entire innovation process and related enterprises.

Therefore, within the context of the development of a robust and sustainable innovation ecosystem in the UAE, there must be a complementarity of open innovation as a process and IP as the facilitating body or rules and regulations which catalyze and facilitate an efficient system of global transactions. For this to rapidly transpire, a sophisticated interdisciplinary expertise needs to be established: the capability and capacity in identifying, accessing, absorbing, and assembling innovation, and importantly the attendant IPRs. All personnel involved, whether scientific, legal, business, managerial or governmental, including (but not necessarily limited to) innovators, researchers, developers, and marketers, verily 'must ensure that all technologies and associated IPRs required to support [an innovation R&D enterprise] are collected from various owners; the problem of collecting all the required rights is the IP assembly problem. As innovations become increasingly dependent on multiple IPRs, likely with multiple IPR holders, the IP assembly problem becomes more complex, creating a pressing need

for well-functioning technology markets and technology management.' (Granstrand and Holgersson 2014)

The dynamism of the open innovation system is thereby greatly enabled by sophisticated knowledge and IP management, tech-transfer, and related licensing acumen: 'The whole discussion on open innovation is actually … about building a business model utilizing inward and outward licensing, because it argues that innovation strategy should consider not only the product, but also the technology market. The rise of innovation models utilizing multi-field and outside knowledge and the associated rise of patent licensing is a call for new policies and strategies for business firms and governments, particularly those in latecomer countries [e.g., UAE], to handle a whole new group of issues.' (Lee et al., 2013, pp. 34) In other words, by lowering attendant risk, i.e., reducing transaction costs, a sophisticated ability to manage and assemble IPR not only facilitates, but sustainably drives the open innovation process; parties to an innovation/technological transfer can thereby operate as co-equal partners in negotiations, licensing, and even determination of downstream ownership partition of that which might, and most likely will, pertain to subsequent innovations that arise from any given R&D program, whether in health, energy, agriculture, communication or other emerging important field.

In the world of global business transactions, this is becoming the norm, epitomizing the major trend of global economic development in this century: 'IP management and the increased skill with which it is managed by companies has assisted them in developing open innovation strategies. The way in which open innovation operates in a commercial firm is the outgrowth of the need to access resources from a variety of partners. IP ownership enables firms to conduct the trade in technology that accompanies an open innovation strategy... .' (Hall, 2010)

Organizational capability and capacity, whether public or private sector entities, large companies or SMEs, or even nation States, must therefore be optimally configured and networked in order for open innovation, which necessarily entails strategic IP management, to sustainably develop and thrive, i.e., the 'ability to mobilise knowledge and technological skills in order to create new economic value.' (Mahroum, Alsaleh and Kanhere, 2013, p. 11) This, in turn, necessitates that developing and transitioning countries accept and adapt to a dramatic paradigm shift, 'to identify and cultivate new … models to appropriate the potentiality of technology implied by an open innovation paradigm … to utilize and combine diverse sets of technology to enhance the value of output … . Therefore, the necessity of growing the

capability to … [build] a proper … model [system of BP] to design products in a timely manner has risen.' (Lee et al., 2013, pp. 35)

The UAE still (fundamentally and chronically) lags in this respect. As with the impressive physical infrastructure of gleaming skyscrapers, a world class airline (replete with showers in first class) and staggeringly luxurious amenities (not to mention Ski Dubai), the current UAE institutional infrastructure, whereas also ostensibly impressive, is neither configured to incentivize innovations nor to integrate and coordinate societal resources and human talent to absorb, assimilate, assemble, and apply external knowledge via the open innovation paradigm. The requisite human capital and institutions are simply missing. Although '[t]he UAE institutional context is highly conducive to attracting and acquiring external knowledge, as well as for the transfer and circulation of knowledge among foreign firms and their workers,' (Ewers, 2013, p. 135) this appearance of a seemingly sophisticated and progressive system is misleading: the institutional status quo is absolutely inadequate for innovation-driven development. There is 'a lack of ability to absorb, adapt and create new technology and knowledge.' (Abdalla Alfaki and Ahmed, 2013, p. 11)

IPR transaction costs (e.g., licensing) dramatically and proportionally decrease as capacity and capability increase with respect to human capital and institutional infrastructure. This principle is not inconsistent with the theory propounded by Nobel laureate economist Ronald Coase (1990), that is, if transaction costs are zero and property rights are well defined, the parties to a transaction can bargain to an efficient result regardless of which party holds said rights. The decrease in perceived risk to the transaction via capable, confident, consistent acumen in IP management and tech-transfer is a key facilitating ingredient, effecting success or failure of tech-transfer in the global open innovation marketplace. The same is also alluded to by Baldia (2013, p. 24): 'If the licensor foregoes entering the transaction at all in light of high transaction costs, both parties and the market in which they were to collaborate suffer lost opportunity costs. In either scenario, the licensor has engaged in sub-optimal commercial activity because the outcome in each case is economically inefficient.' In the context of the foregoing, it is arguably prudent that the UAE shall not ignore or delay serious strategic and sustainable capacity building lest it be left behind, whilst other countries leapfrog over it into the dynamic, innovation-driven economy of the new century.

A. The UAE and Knowledge-Based, Innovation-Driven Development: A Nation of Expatriates and Welfare

As with many the other hydrocarbon-based economies of the GCC, the easiest (and perhaps safest) path to "development" has been via leveraging the copious flow of wealth towards foreign, i.e., expat professionals, be they human or, as is the case with MIT and Masdar, institutional. However, whether seemingly altruistic or not, it is crucial to never forget that the ranks of expats are disproportionately populated by single-minded mercenaries, who seek partnerships for a pecuniary purpose, an unsustainable proposition. (The Economist, 2016e)

> [M]uch of the knowledge-based expertise in the Gulf has been imported from abroad as a way to "leapfrog" the development cycle. This system of importing knowledge-based expertise does not contribute to the sustainable shift toward a knowledge economy in the Gulf, however. When a knowledge-based economy is built upon a foundation of foreign or transitional labour and expertise, sustainable change cannot occur. Broadly speaking, Gulf national capacity has not been simultaneously or equitably developed to sustain the knowledge base without reliance on foreign expertise. (Wiseman, Alromi and Alshumrani, 2014, pp. 4-5)

A move towards Emiratization of the UAE (Wiseman, Alromi and Alshumrani, 2014, p. 6), will necessitate far more than well-intentioned proclamations and ad-hoc programs dominated by mercenary expats. Thus, the UAE faces what can be perhaps best described as an expat dilemma.

The key and central issue the UAE faces is "whether a society can transfer to a knowledge economy when a large part of the highly skilled and motivated workers i.e. the knowledge workers, are in fact expats." (Hvidt, 2015, pp. 44-45) For the UAE, the answer to this question must be in the affirmative. However, weaning off of the intoxicant of expat "help" will need to be systematic, strategic and sustainable.

The persistent presence of expats must therefore be systematically managed, incrementally matched and replaced by UAE talent, expertise, commitment and ultimately ownership. When the petrol runs out, the expat will as well: "[T]he higher the number of expat knowledge workers relative to national knowledge workers, the higher the risk to the national economies if all or a portion of the workers for some reason were inclined to leave the country. … Thus the policy implication for the Gulf countries related to this issue must be …[placing] an increased emphasis on educating their

own people to become knowledge workers." (Hvidt, 2015, pp. 44-45) The UAE must begin to invest now in building the new, virtual, human capital and infrastructure, necessary for dynamic and rapid transition to a knowledge-based economy. All resources will necessarily need be utilized, particularly all available human talent, with an emphasis on the greatest underutilized resource in the UAE: women.

B. Empowering Women in the UAE: A New Model for a New Century

Underutilization (or even non-utilization) of valuable natural resource wealth is obviously not a good strategy for building economic power under any circumstances. Consider, for example, this hypothetical: a country which possesses vast oil fields, many of which, albeit clearly known, remain untapped due to ancient cultural restrictions imposed on the land under which they lie, e.g., association with superstitious legends and unauthenticated folklore. Outdated, obsolete concepts and paradigms obstruct realization of this vast resource, and the potential wealth that it embodies is thereby neglected and derelict. Likewise, if countries of the GCC truly aspire to accelerate development of innovation-drive economies managed by their citizenry, then they must fully utilize their most valuable human capital resource: women.

The bias that women should not assume dynamic leadership roles in the GCC countries must yield to the reality that knowledge-based economic systems, which are driven by IPRs, necessitate mobilization of all human resources. Furthermore, women in the GCC are increasingly demonstrating their extraordinary capability in intellectual prowess, albeit still chronically under represented as knowledge workers, much less leadership roles. "In one unexpected way, however, Arab institutions are making rapid progress. Women now outnumber men in half of the top 15 Arab universities. Even in Saudi Arabia, where women cannot drive and must have permission from a male guardian to travel, women's faculties are being added to what were all-male institutions. King Abdulaziz's student body has 57 female students for every 43 males. Sadly, female graduates are not going into the workforce in the same numbers as their male peers." (Economist, 2016a)

Ironically, in the UAE, the vast underutilized resource of female human capital is juxtaposed against the prevailing presence of expat mercenaries, who have at best dubious devotion to the country's future prosperity or even survival. The need to modernize the indigenous knowledge workforce is glaringly obvious: "[T]he share of women entering higher education and their further integration into the workforce has consistently increased over the past two decades and currently constitutes 65% of graduates in the UAE.

However, several challenges remain with regard to human capital. … [D]espite an increasing trend, female participation in the workforce remains low, around 28%. The under-representation of women in the workforce is especially surprising when one considers that they are the majority in tertiary education. Moreover, girls perform better in school than boys. Reducing this gender gap is of concern, given that the integration of women in all fields is key to economic growth and to creating local capabilities for innovation." (Aswad, Vidican and Samulewicz, 2011, p. 560)

This gross underutilization of human capital is juxtaposed against the role that women professionals have assumed in the fields of IP, innovation management and tech-transfer across the globe, throughout organizations and even other emerging and developing countries. In 2010, in the Philippines, "IPOPHL launched a project to establish Innovation and Technology Support Offices (ITSO) or 'Patent Libraries' within universities and higher education institutions. The objective was to strengthen local institutional capacity to access patent information for use in research, education, idea generation and general business development. At the same time, the ITSOs were envisioned to be the patent service providers in their local communities, conducting not only patent searches but also patent drafting, prosecution representation, advisory, training and over-all IP management." (http://info.ipophil.gov.ph/itso/) Notably and exemplarily, it must be understood that over 40% of the ITSO managers are women. In the globally-networked organization AUTM ("the Association of University Technology Managers … a non-profit organization dedicated to bringing research to life by supporting and enhancing the global academic technology transfer profession through education, professional development, partnering and advocacy", http://www.autm.net/), the leadership role of women is impressive and commendable: Since the turn of the current century, the presence of women serving in leadership positions on the AUTM Board of Directors has averaged 37%. This further reinforces the fundamental proposition that women need be not only participants but leaders in advancing establishment of innovation ecosystems in developing and emerging economies across the globe, regardless of previous cultural traditions and societal bias; the stakes are too high, the need, too urgent to ignore this fundamental principle of development.

Yet, as with other related parameters, when compared to the other GCC countries, the UAE might hold greater promise for empowering women to assume leadership roles in building a globally networked, innovation-driven economy. For example, "[i]n the labour market females have also made impressive progress over the last 20 years, although participation remains low by global standards." (EIU, 2014, p. 3)This is not necessarily a negative,

as women are a reserve knowledge labour force, ready, able and willing to assume a dynamic role in the nation's developmental diversification towards innovation and IP.

Notwithstanding the foregoing, in the UAE, full engagement of women in a knowledge-based economy workforce is still far from a fait accompli. Challenges persist: "Females face an array of obstacles in the workplace, including managing a work-life balance; cultural obstacles, such as society seeing women as family caretakers rather than engineers or scientists; a dearth of role models and mentors; and gender discrimination. More proactive measures from both the public and the private sector are needed to tackle these obstacles. … [However] if the female labour participation rate reaches the same level as that for men, GDP could benefit by as much as 12%." (EIU, 2014, p. 4) This challenge is exacerbated by the negative impact of petrol wealth: "the vast oil incomes have dulled the aspirations and incentives for the younger generation of Gulf Arabs to actively pursue education at all levels: primary, secondary and tertiary. This seems to be especially true for boys, who are significantly under represented in the university system by a ratio of 3 to 1."(Hvidt, 2015, pp. 37-40)

Furthermore, as Ross made clear, "Oil not only hinders democracy; it also hinders more equitable gender relations." (Ross, 2008, pp. 15) To take this concept one step further, in addition to, and likely complicit with, long-standing and deeply rooted cultural norms and practices (e.g., "Bedouin biases" and not Islam per se, Al-Nasr, 2009), the resource curse has also negatively impacted effective economic participation of women in the GCC petrol-rentier economies. This development challenge must be overcome in order to transition to the full utilization of the most valuable, albeit heartbreakingly underutilized, capital asset of this century :women.

IV. The UAE: Intellectual Property Laws, Patent Data and Innovation Infrastructure Gaps

In a post-TRIPS world, the UAE, as with nearly all developing, emerging and transitioning economies, is, at least on paper, IP compliant and presumably a beneficiary of the global system. (Birnhack and Khoury, 2016) However, closer analysis suggests that much still needs to be done to fully realize the true value of IP and its role in accelerating innovation-driven, knowledge-based development. In other words, the tools are available, but few know how to appropriately, effectively and strategically make use of them.

A sampling of pertinent laws and treaties illustrates that the IP law toolbox is indeed well stocked in the UAE, (http://www.wipo.int/wipolex/en/profile.jsp?code=AE):

UAE IP Treaties:

- Berne Convention for the Protection of Literary and Artistic Works (July 14, 2004)
- WIPO Copyright Treaty (July 14, 2004)
- Patent Cooperation Treaty (March 10, 1999)
- Paris Convention for the Protection of Industrial Property (September 19, 1996)
- World Trade Organization (WTO) - Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) (April 10, 1996)
- Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (December 11, 2014)

UAE IP Domestic Laws:

- Federal Law No. 37 of 1992 on Trademarks (as amended by Law No. 19 of 2000 and Law No. 8 of 2002) (1992)
- Federal Law No. 40 of 1992 on the Protection of Intellectual Works and Copyright (1992)
- Federal Law No. 31 for the Year 2006 Pertaining to the Industrial Regulation and Protection of Patents, Industrial Drawings, and Designs (2002)
- Federal Law No. 7 of the Year 2002 Concerning Copyrights and Neighboring Rights (2002)

Establishment of appropriate laws and regulation, albeit absolutely essential, only represents an initial step in the establishment of an innovation-driven economy. As previously noted: "As the UAE evolves in its innovation journey, it will need to build a robust and enforceable intellectual property rights system. Recently, the government has reviewed its laws on intellectual property and copyright and harmonized them with international standards (e.g., the US Patent Office and Patent Cooperation Treaty)." (Byat and Sultan, 2014, pp. 107-109) IP law as one, albeit essential, component of a high-functioning innovation ecosystem, does not exist in a vacuum; it

is part of a much larger, interconnected, dynamic and global innovation/ business ecosystem.(Birnhack and Khoury, 2016)

A robust IP right system is like a complex machine with many moving parts, e.g., "gears", which interconnect to drive development. The efficient and strategic use and management of IP fuels this system. Therefore, laws must be viewed and developed whilst remaining constantly cognizant of context:

> [I]t is important for the drafters of IP laws in developing countries to increase their understanding as to how IP can affect their economies and how to connect it with the economic realities of their countries. While IP may bring Foreign Direct Investment (FDI), technology transfer, domestic innovation, and Research and Development (RD) to developing countries, economic development will not occur simply through the introduction of IP laws. Policy makers in developing countries need to consider broader development initiatives in the structuring of their IP system. To this end, every provision that is introduced into the IP law should be studied and examined as a part of the *broader development plan* for the country. (Olwan and Fitzgerald, 2012, p. 88, emphasis added)

This is, of course, assuming there even is a "plan". One measure of how well the "IP system" is functioning, i.e., where the country might be in terms of knowledge-based development, is patent information-data analysis.

Whereas patent data should not be relied on, and indeed can even be beguilingly deceptive, as a primary metric for innovation (McGregor, 2007; Nagaoka, Motohashi and Goto, 2010; Steen, 2010), they are nevertheless at least indirectly indicative of where a country is in terms of its IP and development status, or lack thereof. They may, therefore, be informative on a case-by-case basis; cautious interpretation might thereby provide insight into the innovative situation in a country. In the case of the UAE, patent data qualifiedly appears to be useful, with judicious analysis, as one proxy measure for the level of innovation in the country and also indirectly to approximate whether the innovation in the UAE is indigenous or foreign. Tables 1 to 3 provide patenting statistics which support the proposition that neither is the UAE innovative nor is the IP regime in the country supportive of domestic innovation. Instead, it primarily benefits foreign owners of IPRs (i.e., patents).

Table 1 UAE Patent Applications

Year	Resident	Non-Resident	Abroad
2001	1		9
2002	3		28
2003	5		50
2004	2		51
2005	7		64
2006	4		99
2007	4		101
2008			77
2009	3		101
2010	3		136
2011	26	1,325	197
2012	26	1,331	246
2013	30	1,408	386
2014	49	1,443	343
2015	15	1,738	349

A resident filing refers to an application filed in the country by its own resident; whereas a non-resident filing refers to the one filed by a foreign applicant. An abroad filing refers to an application filed by this country's resident at a foreign office. Blank cells indicate absence of data (e.g., missing/incomplete/not-reported).

Source: http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=AE

Patent application filings in the UAE has been dominated by foreign (non-resident) entities (Table 1). Albeit recently, since 2011, there has been a, somewhat tepid, increase in UAE national (resident) filings, it is still a mere dribble in comparison to the foreign entity filings, i.e., cumulatively at only 2 per cent. However, the number of patent applications filed abroad by UAE nationals has increased significantly since 2001, suggesting that UAE nationals are absolutely capable of creativity and inventiveness when working within actualized and functionally robust innovation ecosystems. This is a key point, that IP flourishes in dynamic innovation ecosystems and talent will move to such locales: the globalization of this phenomenon is ignored at one's peril, i.e., the global innovation juggernaut is increasing in intensity regardless of where countries aspire to be.

Table 2 UAE Patent Grants

Year	Resident	Non-Resident	Abroad
2001			
2002			
2003			12
2004			5
2005			3
2006			16
2007			35
2008			35
2009			23
2010			28
2011	2	98	35
2012	1	39	50
2013	1	62	68
2014	3	110	121
2015		177	94

A resident filing refers to an application filed in the country by its own resident; whereas a non-resident filing refers to the one filed by a foreign applicant. An abroad filing refers to an application filed by this country's resident at a foreign office. Blank cells indicate absence of data (e.g., missing/incomplete/not-reported).

Source: http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=AE

Although less, possibly due to prosecution status, patent grants fundamentally parallel patent application filings in the UAE (Table 2). Similarly, and not surprisingly, foreign (non-resident) entities dominate, with significant UAE expat (UAE residents abroad) displaying substantial evidence of inventive behaviour that apparently is not fully realized and actualized in their home country.

Table 3 UAE Patent Documents Top Applicants

Applicant Name	Applicant Country and Product/Service	Number of Patent Documents
Qualcomm Incorporated	USA, Semiconductor and telecommunications	55
Halliburton Energy Services, Inc.	USA, Products and services to the energy industry	44
Welltec A/S	Denmark, Well intervention solutions and completion products for the oil and gas industry	38
Borealis AG	Austria, Producer of polyethylene and polypropylene	30
Raytheon Company	USA, Weapons and military and commercial electronics	25
Novartis AG	Switzerland, Multinational pharmaceutical	24
Gojo Industries, Inc.	USA, Health and hygiene products	19
Sicpa Holding SA	Switzerland, Identification, traceability and authentication solutions and services	16
BASF SE	Germany, Chemicals	16
Schlumberger Canada Limited	Canada, Oil and natural gas	15

Source WIPO Patent scope UAE National Collection
https://patentscope.wipo.int/ (2,947 Records)

That foreign entities dominate patent activity in the UAE is clearly illustrated (Table 3), with the predominant patentees' nationalities being American, Canadian, Austrian, Dutch, German and Swiss; not surprisingly, technology sectors include petrol and chemical industries and military industrial sectors. To further corroborate this data (Tables 1, 2, 3), analysis of patent information culled from Thomson Innovation® (the leading IP, intelligence and collaboration platform for patent data and informatics) estimates that, since 2001, total (priority) patent family filings in the UAE jurisdiction are only 120 (analyzing 111 INPADOC and 130 DWPI families, from a total of 292 patent document records identified). This provides additional support for the proposition that the majority of patents in the UAE is

flowing into the country, and not generated therein. Interestingly consistent with said trends in patenting in the UAE, trademark registration appears to follow the foreign ownership pattern: "[T]he volume of mark registrations in the UAE by non-residents far exceeds the number of marks registered by UAE residents in their country. For example, according to WIPO, in 2013, 18,747 marks have been registered. Of these only 5,293 are owned by UAE residents (28.2%), while the majority of these marks (13,454 marks, which are 71.7%) are owned by non-residents." (Birnhack and Khoury, 2016, pp. 32)

Furthermore, this data is consistent with observations of previous commentators: utility patents obtained by the UAE between 2009 and 2013 are only 120 (Hvidt, 2015, p. 32); several years ago, the number of patents originating from the UAE (including Dubai) registered with the USPTO were only 136, with 186 pending patent applications originating in the UAE (Khoury, 2009, pp. 105-107). On a per capita basis, relative to countries with roughly comparable GDP per capita, utility patents (2011-2012) per million populations, (at 1.5) compared to Korea (at 241) and Singapore, (at 126) seems alarmingly low. (Ahmed and Abdalla Alfaki, 2013, p. 98) Notwithstanding this, it is somewhat encouraging to note that over a period of five years the number of registered UAE patents nearly doubled, with the UAE now generating the highest number of patents per capita in the GCC region. (Mahroum, Alsaleh and Kanhere, 2013, p. 24)

Nevertheless, the patent data strongly suggest a more deeply rooted, systemic problem: "The fact that currently over 225,000 patents are granted yearly across the world provides proof that knowledge and information is being mass-produced today. The weak performance of the [GCC] in both research and in the actual number of patents granted is a testimony to the low levels of funding for research over the years and to the resulting weakly developed research infrastructure in the region." (Hvidt, 2015, pp. 44-45) Patent data are an imperfect metric for innovation, yet when considered in the larger context of the UAE's current lamentable status as an aspiring knowledge-based economy one reasonable conclusion is that "it is imperative to invest more in the human factor that will, in time, also contribute to the creation of patentable inventions in various areas." (Khoury, 2009, pp. 105-107) In other words, an innovation ecosystem in the UAE will be the fertile ground from which patents sprout.

Analysis of these patent data indicate that IPRs, e.g., patents, in the UAE primarily benefit non-UAE external interests and are not indicative of any significant development of the UAE towards becoming an innovation-driven economy. This further reinforces the argument that an ad-hoc,

expat/consultancy approach is neither strategically sound nor sustainable: "The insignificant relationship between IPRs and economic growth in the case of GCC countries might be related to the fact that GCC countries are 'rentier states' in which IPRs per se are not sufficient to ensure technological progress and innovations. The results suggest that for IPRs to promote innovations and economic growth, a coherent set of complementary policies are required, and that the governments of the GCC countries need to play a positive role in inducing technology acquisition and creation [i.e., the open/symbiotic innovation system]." (Al-Mawali, 2015, p. 245) Pessimistically, commentators have even suggested that it will take 20 years for the UAE to realize its aspirational goals towards becoming a knowledge economy. Aspirations appear to be inversely related to current reality, and patent data supports this proposition. "It is clear that the UAE had not achieved a stage of being a leader, particularly in the most critical indicators for knowledge based development: journal articles per capita, patents per capita, and high technology % of manufactured exports. For instance, in terms of both journal articles and patents per capita, the UAE is quite far from achieving this level at least in the following 15-20 years [that is, an estimated 2 decades required for catch-up]." (Parcero and Ryan, 2016, p. 17)

The innovation shortfall appears to be endemic to the region, e.g. the GCC and its neighbours. This is somewhat perplexing in that "Arab countries produce 5.9% of the world's GDP, but the region's governments account for less than 1% of total global R&D spending, according to UNESCO. Bahrain spends just 0.04% of GDP; Egypt spends 0.7% (see chart). By contrast India spends about 0.8% and Britain 1.6%. … [UAE only 0.5%]." (Economist, 2016c) In addition, "[t]he bigger deficit … is that private companies barely spend on R&D … in much of the Arab world the private sector's contribution is less than 5%." (Economist, 2016c) This strongly suggests that in the Arab world, and the GCC countries in particular, contribution to the generation of new knowledge has been insignificant: "The UNESCO World Science Report of 1998 reported on four indicative performance areas as follows: Expenditure on Research and Development, Scientific Publications, European Patents and US Patents. At that time, in all of the key indicative areas, the Arab world, with a combined population of approaching 300 million, was making a contribution less than that of sub-Saharan Africa." (Light foot, 2014, p. 90)

Therefore, "[W]ays should be worked out to ensure better use of networks for international sourcing of knowledge broadly in the economy. Competencies attracted from abroad should be encouraged to 'take root' locally. Improved conditions for seed and venture capital funding, enhanced

interconnecting roles of universities, science parks and incubators, and improved conditions for technology based entrepreneurship, are needed. Measures should also be deployed to spur the rise of a community of professional private service providers, that can help underpin and boost the capability of both larger firms and Small and Medium-Sized Enterprises (SMEs) ..." (IKED, 2010, p.10) However, what are the "ways" to move forward? This article will strive to address that key question with a 10-point strategic action plan.

A. Policies, Initiatives and Investments for IP/ Innovation Development in the UAE: Towards a Triple Helix System

Current policies, initiatives and investments seem to be made in the UAE to catalyze accelerated development of an innovation-driven economy ... to move beyond petrol to patents. However, these largely appear to be ad-hoc, poorly strategized, expat/consultant dominated approaches. What is missing is a systematic indigenous capacity building effort towards establishment of a functional and sustainable triple helix. But what is this "triple helix"? As elucidated (Ranga and Etzkowitz, 2013):

> Triple Helix systems [is] an analytical construct that synthesizes the key features of university–industry–government (Triple Helix) interactions into an 'innovation system' format, defined according to systems theory as a set of components, relationships and functions. ... The relationships between components are synthesized into five main types: technology transfer; collaboration and conflict moderation; collaborative leadership; substitution; and networking. The overall function of Triple Helix systems – knowledge and innovation generation, diffusion and use – is realized through a set of activities in the knowledge, innovation and consensus spaces.

In other words, the triple helix concept is the triadic combination of university-industry-government which becomes the source of innovation and economic development in a knowledge society. (El-Khasawneh and Pech, p. 499)

The ultimate goal of establishing the triple helix in the UAE is to drive sustainable and dynamic network synergy. "This includes entrepreneurs, government entities, educational institutions, funds, the media, entrepreneurial organizations, and others. Unlocking innovation requires getting these disparate parties with distinct agendas to work together to drive the same objective." (Byat and Sultan, 2014, pp. 107-109) An essential step towards

change is increasing collaboration between academia and industry, which requires a broad approach to develop networks and linkages. Such academic-industry collaborations will positively impact the level of innovation in the UAE. (Pervan, Al-Ansaari and Xu, 2015, p. 3) Academic-industry collaborations further benefit the private sector by establishing "close ties with academic institutions, both physically and intellectually, to maintain ongoing relationships, gaining benefits of talent recruitment, technology-transfer, research and development capability and innovation stimulation." (Pervan, Al-Ansaari and Xu, 2015, p. 3)

For the UAE, an innovation ecosystem will need to be composed of a dynamic system of organizations that can assimilate, adapt and create knowledge, with an educated population that can both create knowledge and use it effectively. Within the context of the triple helix concept, "a good innovation system consists of an interconnected array of universities, research centers, firms, consultants, and other organizations that create, assimilate, and adapt knowledge," (Parcero and Ryan, 2016, p. 11) wherein the government must provide incentives for the creation, dissemination and use of existing knowledge, (i.e., the open innovation paradigm as more thoroughly discussed below). (Parcero and Ryan, 2016, p. 5) Sadly, as articulated by Parcero and Ryan, "the indicator S&E journal articles per capita shows a very low performance for the UAE …. This is a result of the fact that until recently the universities focused on teaching and were behind in terms of research." (Parcero and Ryan, 2016, p. 11) Furthermore, "for … [university-company research collaboration, i.e., public private partnerships] … the UAE fall[s] short of what one would expect." (Parcero and Ryan, 2016, p. 12) This further corroborates that the UAE has very poor performance in innovation. Indeed, the triple helix is still in early development phase. IP protection is not the same as IP creation which is not the same as IP management/transactions.

The dynamic, interconnected and mutual complementarity of the university–industry–government interactions is what drives the ongoing development of the innovation ecosystem; it is a synergistic symbiosis of investment, knowledge, IP and innovation. However, it must be conceptualized, built and implemented according to the specific situation, needs and challenges facing the UAE, and not as an attempt to re-create Silicon Valley, Research Triangle (North Carolina) or Route 128 (Massachusetts).

In order to accomplish such a monumental task, to rapidly forge a strong triple helix, a set of fundamental components must be committed, including:

- strong supportive infrastructure that is capable of accessing the physical and financial capital to effectively create, transfer and commercialize knowledge,
- networks within an economy, linking the public and private sectors with government as well as other, national and supranational organizations,
- innovation policies both private sector-oriented (e.g. business support and advice, risk capital, loans and subsidies, etc.) and innovation system-oriented (e.g. network building and brokering through cluster development and other system-enhancing interventions),
- policies facilitating innovation-based development recognizing country specific conditions that influence the interactions between the various stakeholders in knowledge creation/value-creation activities, (Mahroum, Alsaleh and Kanhere, 2013, p. 5)

Currently, there are several initiatives in the UAE to foster development of an innovation ecosystem. These include the National Research Foundation (NRF), "founded in 2008 to help build a competitive knowledge economy in the UAE and be a key element in the UAE national innovation system." As a "key element", three components are central to the national innovation system: knowledge production, knowledge application, and knowledge diffusion. Launched in 2007, the Khalifa Fund "seeks to help develop local enterprises in Abu Dhabi, with a total capital investment of AED 2 billion," to "create a new generation of Emirati entrepreneurs by instilling and enriching the culture of investment amongst young people, as well as supporting and developing small to medium-sized investment in the Emirate."(El-Khasawneh and Pech, pp. 507-508) Furthermore, "Dubai has established the Emirates Institute for Advanced Science and Technology (EIAST). This institute aims to "enhance prosperity and support sustainable development by inspiring scientific innovation and fostering technological advancement." (Khoury, 2009, pp. 105-107) As another example, "Takamul is an initiative launched by the Technology Development Committee (TDC), in the emirate of Abu Dhabi, to provide support for companies and individuals seeking to file patents. Through the Takamul Initiative, the government of Abu Dhabi aims to create awareness of IP rights and to provide legal and financial support for international patent filings." (Mahroum, Alsaleh and Kanhere, 2013, p. 23) "In addition … [t]he total number of patent applications underwritten by Takamul has now risen to 66, of which 33 were underwritten in 2013 alone." (Byat and Sultan, 2014, pp. 107-109)

The business newspeak used to describe these various and sundry initiatives is mind-numbingly beguiling, possibly to inspire confidence that "progress" is occurring notwithstanding the thick fog of bureaucratic jargon? Yet, the list of "innovation initiatives" in the UAE only continues:

> Khalifa University and Mubadala Aerospace are planning to establish an aerospace research and innovation centre .... Beyond driving R&D in universities, the UAE government is keen on establishing scientific hubs to address socioeconomic issues relevant to the region. For example, Techno Park was established as a science and technology park whose scientific activities are managed by the Dubai Institute of Technology (DIT). DIT is focused on enhancing research in five sectors: water, health, energy, engineering, and logistics and mobility. The International Center for Biosaline Agriculture is another example of an R&D centre focused on innovation specific to regional issues, ... [aspiring] to deliver agricultural and water scarcity solutions in marginal environments. (Byat and Sultan, 2014, p. 107)

Ambitious plans, aspirational proclamations and leapfrogging "logic" aside, all of this appears to ignore the grueling reality of pragmatic indigenous capacity building. Respected commentators have (indirectly and politely) intimated the makeshift nature of such initiatives, e.g.: "[W]here the UAE still has room for improvement is in its ability to create new knowledge and, to a lesser extent, in its ability to commercially exploit innovations. Aware of the need for further improvement along these two dimensions, the government has launched several initiatives to support entrepreneurs and build the environment required to encourage start-ups ... R&D and innovation." (Mahroum, Alsaleh and Kanhere, 2013, p. 4) Where is the coherent, coordinated, clearly articulated national plan to accelerate development of an innovation ecosystem in the UAE? Perhaps, if enough mud is flung at a wall, some will eventually stick? All of this is, albeit highly aspirational, replete with current operational jargon and optimistically "visionary", lacking in strategy and tactical steps towards implementation. Revealingly, "Although at the present time there are no direct policies that address innovation, there are certain initiatives that foster the development of entrepreneurial innovation and activity. For instance, the Masdar Institute Science and Technology, announced that the Institute plans to launch the Center for Innovation Systems and Entrepreneurship (CISE). The CISE is a new initiative to further develop and spread entrepreneurial *spirit among youth* in the UAE."(Erogul and Horne, 2014, p. 203, emphasis added) Whereas important in terms of attitude, "spirit" alone is not enough. Highly aspirational, yet sorely lacking strategically, how might this apply to the development of a

tech-transfer system? Does CISE imply a nascent innovation ecosystem? For example, how does it contribute to the development of a triple helix system in the UAE? Who will make use of BP in IP management and tech-transfer? And just what should BP entail for the UAE? Initiatives ostensibly poised to address these questions include: "Dubai Internet City, Dubai Technology Park and Dubai Silicon Oasis, Khalifa University for Science, Technology and Research and Masdar Institute in collaboration with MIT in the United Arab Emirates". (Tadros, 2015, p. 5) Perhaps the Masdar Institute program can provide greater guidance in this regard?

As reported in 2013, Masdar Institute (a private academic research institute) had entered into a collaboration with MIT, sharing R&D interests focusing on alternative energy and sustainability, in advanced technologies, and innovation and entrepreneurship, all of which represent increasingly critical global innovation sectors and skills. Masdar had been envisioned as a bridge between industrial and academic interests in the UAE, i.e., as a sort of proto triple helix platform. In order to accelerate establishment of a robust innovation ecosystem in the UAE, the Institute Center for Innovation and Entrepreneurship (iInnovation) was created. This "center forms the final piece of the Middle East's first large-scale industry-academia research collaboration, and is the fifth Masdar Institute center (iCenter). It is charged with channeling the University's research into innovative commercial products and services by facilitating the formation of new startups."(MIT, 2013)

The MIT – Masdar Institute collaboration focuses on several key research project areas, in the broad categories of clean and renewable energy, water purification, and next-generation crucial infrastructure "smart" technologies, including:

- low-cost water-monitoring device for sensing blooms of potentially toxic algae,
- waste-water filtration and treatment system,
- high-efficiency membrane-based approach to desalination,
- energy-efficient transmitter for wireless communication,
- water desalinating technology, and
- solar energy. (Stuart, 2015)

From the Masdar Institute website (https://www.masdar.ac.ae/research/research-centers/icenters-research/cise) one can learn more about the ambitious agenda that has been set: iInnovation facilitates innovation and

entrepreneurship activity at Masdar Institute and throughout the UAE, to accelerate technology-based innovation and entrepreneurship by:

- Adapting BP from world-class innovation hubs to meet requirements in Masdar Institute and the UAE;
- Supporting the translation of technology research into innovative commercial products, services and processes; and
- Working with stakeholders to improve the innovation ecosystem in the UAE.

Research theme areas are:

- Translation of university research into commercially viable products, services and processes that provide the foundation for startup companies
- Technology-based entrepreneurship in the UAE and abroad
- Innovation policy.

Additionally, from the Masdar Institute website (https://www.masdar.ac.ae/research/office-of-vice-president-for-research/technology-transfer-office):

Tech-transfer Office (TTO)

The TTO is responsible for managing the Institute's IP and promoting the effective commercialization of Masdar Institute's research. To achieve this, the TTO manages the patenting and licensing of faculty and student inventions, provides training on IP and advises on IP terms of sponsored research and other agreements with external parties. The office assists with developing and managing the Institute's IP policy and works with the Masdar Institute Intellectual Property Committee to engage the Institute community in building a strong IP infrastructure. TTO contact: James Petell (Director of TTO)

One might envision iInnovation (replete with the Masdar Institute TTO) as a tech-transfer office/center/hub. Based on this, what might go wrong? Five possibilities immediately present themselves:

1) There is most likely an over-reliance on expat experts, whether MIT consultants or MIT itself as an entity. It is crucial for the UAE to remember that petrol dollars attract "help" of this kind. The UAE must wean itself off the expat addiction (and consequential learned helplessness) and become strongly self-reliant.

2) Basic R&D should not be the emphasis; rather, accessing, absorbing and adapting existing innovation via an open innovation strategy, e.g., driven by BP in IP management and tech-transfer including collaborative R&D, in-licensing, cross-licensing and other IP assembly mechanisms.

3) Following from number 2, the linear, MIT model of R&D, i.e., disclose, invent, patent, license, revenue (and then repeat, repeat, repeat) is not appropriate for the UAE. Open innovation is the UAE's best strategic option for development. The UAE is currently innovation impoverished, and must build a solid foundation in order to rapidly develop a sustainable innovation ecosystem.

4) There is a general lack of indigenous UAE capacity building in terms of IP management and tech-transfer capabilities (over reliance on expats). UAE men, and importantly women, must become the leaders … indeed trailblazers, of the UAE knowledge-based economy.

5) The UAE must not fall into the MIT or Silicon Valley want-to-be delusional trap. It cannot be or have a Silicon Valley or MIT. It needs an appropriate and realistic capacity building strategy.

Whereas the MIT – Masdar Institute collaboration has ostensibly admirable intentions, solid financial backing and prudently chosen technological sectors, it is also plagued with ongoing limitations which also, ironically, account for its initial successes. The policy which forms the foundation of the collaboration is not inconsistent with the formation of a proto-triple helix in the UAE, and as such is commendable and strongly indicates that this initial, and "initial" must be stressed, step has been worthwhile; that is, "advancing the interconnecting roles of universities, science parks and incubators, while taking steps to spur a community of professional private service providers that can help underpin and boost the capability of both larger firms and SMEs in a spectrum of areas, including with regard to funding, marketing, handling IPRs, using ICT innovatively, etc. Important new initiatives such as those associated with Masdar and renewable energy, are important in this context but need to be paralleled by more such efforts."(IKED, 2010, pp. 144-145)

Still, numerous limitations and developmental gaps prevail. For example, as late as 2011, the UAE did not "have a technology transfer office, a science park or a spin-off incubator."(Al-Saleh and Vidican, 2011, p. 26)And as further noted by Al-Saleh and Vidican, "there is still the potential to do more in terms of fostering networks of collaboration between the relevant government agencies, industry and academia." Therefore, what appears to be

happening in the UAE, i.e., the appearance of rapidly becoming an innovative GCC country, must be viewed with extreme caution, as appearance can be, as stated above, beguilingly deceptive. Aspiration does not equal innovation: " … [T]he UAE is in the top tier of 23 innovation-driven economies. This high ranking in innovation is due to the Government's heavy investment in the development of infrastructure. Currently, the UAE Government is seeking increased collaboration between the private and public sector as well as industry and academic partnerships in research and development, recognition of top quality innovative and entrepreneurial talent, and the leveraging of technology and education, as the UAE aspires to become a more innovative economy." (Erogul and Horne, 2014, p. 203) However, the UAE government does not appear to prioritize building its own institutional infrastructure with its own human capital, i.e., a UAE-driven research, innovation, IP enterprise and appears to instead focus on reinforced concrete, glass, money and expat expertise.

B. Appropriate Development Paradigms and Strategies: Open Innovation as Applied to UAE

In order for the UAE to rapidly progress towards becoming a sustainable knowledge-based, innovation driven economy, a paradigmatic shift is necessary: a sophisticated strategy that acknowledges the necessity of serious investment in indigenous human capital and institutional infrastructure. In addition, such a strategy necessarily must recognize the inherent limitations and preliminary tentativeness of current initiatives, such as the Masdar/MIT collaboration, over-reliance on expat expertise and attempts to transplant successful innovation ecosystem models into the nascent UAE innovation environment. In this regard, a future sustainable system of BP will be appropriate in order to relentlessly accelerate development of a UAE-centered innovation, IP, tech-transfer system. To be blunt, if the petrol money disappears, in all likelihood so will the helpful expats, whether they are humanoid or institutional in nature. Therefore, appreciation of the rapidly evolving global innovation system and the dynamics of effectively and efficiently navigating, mastering and succeeding in this increasing complex market are essential.

A realistic appraisal of establishing an innovation system with an appropriate system of BP in IP management and tech-transfer must start with fundamental assumptions:

"[F]ive pillars of innovation capability are … key capabilities that make innovation systems function effectively: accessing, anchoring, diffusing,

creating and exploiting knowledge. The capacity to execute these five functions is the key factor that varies across countries.

1. Accessing: The ability to connect and link to international networks of knowledge and innovation.
2. Anchoring: The ability to identify and domesticate external knowledge sources e.g. people, institutions and firms.
3. Diffusion: The collective ability of a place to adapt and assimilate new innovations, practices and technologies and spread them in the economy.
4. Creation: The ability to generate new knowledge. There is a general perception of a strong and direct link between knowledge creation and value creation.
5. Exploitation: The ability to mobilise and exploit new knowledge for social and commercial purposes. Without this, economies cannot benefit from new knowledge and innovation produced locally/internationally."(Mahroum, Alsaleh and Kanhere, 2013, p. 15).

Innovation must therefore be viewed and conceptualized as a system, a global ecosystem that is integrated and networked to achieve optimal efficiency. As a key driver of this system, IPRs and BP are the indispensable facilitators that enable strategic planning and tactical implementation for R&D, tech-transfer, and commercialization. The UAE is at an early embryonic stage of being truly innovative, and can be even thought of, not disparagingly, as innovation impoverished. A system of BP in IP management and tech-transfer will therefore need to be devised which maximizes the five pillars of innovation capability within the context of the open innovation paradigm.

C. Open Innovation, IP and Development

Open innovation has become a highly refined concept in innovation theory and practice, from the early definition towards a greater holistic paradigm that embraces development and IP. "The open innovation concept is defined as 'the use of purposive inflows [inside] and outflows [outside] of knowledge to accelerate internal innovation and to expand the markets for external use of innovation'". (Pervan, Al-Ansaari and Xu, 2015, p. 2, quoting Chesbrough, 2003). "As knowledge becomes widely dispersed and multi-disciplinary, innovation becomes increasingly open, competitive, co-operative, globalized …. Indeed, innovation in the 21st century is a highly interactive, multi-disciplinary process that involves cooperation among a growing and

diverse network of organizations and individuals across national borders. Such a partnering model is referred to as 'networked' or 'open' innovation." (Baldia, 2013, pp. 14-15)

The dynamic interaction between open innovation and IP has been elucidated by Baldia: "Intellectual property is a key strategic driver of competitive advantage in today's global marketplace. Intellectual property is also the linchpin of the evolving open innovation paradigm. Both globalization and open innovation are profoundly advancing the strategic role and value of intellectual property …." (Baldia, 2013, p. 3) As Baldia further states, this is a global trend that will continue, unabated in the current century: "The evolving innovation landscape … is increasingly open, collaborative, and global in nature." (Baldia, 2013, pp. 5-6) According to Baldia, the current international system of IP transactions is inadequate to realize the full potential of the open innovation paradigm towards accelerating establishment of robust innovation ecosystems in the developing countries: The challenge is "lowering transaction costs and increasing transactional efficiency in cross-border IP exchange transactions." (Baldia, 2013, pp. 5) Appropriate capacity building in human capital and institutional infrastructure replete with a correct application of BP is therefore urgently required in the UAE in order to foster sustainable and efficient IP/innovation transactions which reach deep into the global market. Ergo, the linear model of tech-transfer espoused by mature developed country organizations, e.g., MIT, is not applicable to the developmental realities of the UAE; instead a dynamic open innovation paradigm is apposite. To illustrate plainly: maple trees from Boston cannot be transplanted into the sands of the Al Khatim.

A refinement of the concept is symbiotic innovation. Open innovation is a fluid system. Symbiotic innovation, however, strategically applies open innovation. Such an approach is specifically and urgently necessary for emerging economies, e.g., the UAE, to leapfrog from commodity-based economies to truly knowledge-based, innovation-driven development. Whereas open innovation is serendipitous, symbiotic innovation is strategic:

> Open Innovation focuses on… the inflow of external ideas and the outflow of innovations to market via new channels … Symbiotic innovation recognizes that organizations should look at factors related to spin-in and spin-out at the same time … [beyond merely] 'open,' [i.e., to] evaluate and leverage [their] innovations as something that may help identify and bring value to an external player that also has a technology or capability [needed or required]. Many times this leads to joint development of a new innovation. Technology push and pull are interdependent, collaborative activities that inform each other and

> make each other more successful in the symbiotic approach. (Fuentek, 2015)

The role of the UAE government must be to clearly articulate and establish policy and strategy that then can be implemented via tactics which are sensible in the context of the global open (symbiotic) innovation market. Otherwise, ill-conceived, albeit high level, policy articulations remain divorced from the unforgiving reality of this century, essentially existing in a fictional world of make-believe and bureaucratic fantasy (Let's become just like MIT!). "The role of government is necessary to establish policies and incentives to improve its capacity to promote national advantage and technology development that enables firms to develop innovations and competitive advantages. … That is to say, a policy alone to promote innovation, when there is a lack of synergy between industry players, may be inappropriate and likely to fail." (Pervan, Al-Ansaari and Xu, 2015, p. 2) An illustrative example of how this might be applied pragmatically is water.

> Solving the country's water concerns through research is a prime example of how a knowledge economy should work: initial assessment and policy research carried out by Rand Qatar Policy Institute (RQPI) and the General Secretariat for Development and Planning identified the specific water challenges and suggested solutions. Money through QNRF [Qatar National Research Fund] was then made available for researching solutions. Partnerships were then formed with international companies: for example, Qatar Electricity and Water Company (QEWC) has partnered with Japan's Water Reuse Promotion Center to develop reverse osmosis desalination methods that would greatly reduce energy consumption. (Weber, 2014, p. 65)

As one can construe from this, at the very least, the Qataris understand how to effectively and efficiently mobilize human capital, organize institutional resources and enter into international partnerships to strategically move critically essential technology, i.e., methodically pursue a symbiotic innovation strategy to accelerate access, absorption and adaptation of extant innovation with broad social and economic value. In other words, they appear to be already applying fundamental principles which the UAE should begin to seriously consider.

Perhaps it would be wise for the UAE to look to Qatar for guidance in this respect, i.e., to emulate the approach that Qatar has taken in its knowledge-based, innovation-driven development and concomitant capacity building efforts; in other words, "to increase the level of knowledge and entrepreneurship among their national populations, so that they can

successfully tap into foreign knowledge and adapt and create new knowledge for their countries' own specific needs." (Hvidt, 2015, p. 25) As the IKED Report suggests, the UAE, e.g., Abu Dhabi, has lagged in this respect when compared with other Natural Resource Rich Economies around the world; although it performed well in knowledge anchoring, it was considerably weaker in knowledge access, diffusion, exploitation, and absorption. (IKED, 2010, p. 9)

Open/symbiotic innovation is the wave of the present and the tsunami of the future. The UAE's lack of appreciation of this, and apparent low level of understanding of the role of BP in IP management and tech-transfer for its development is hazardous. Strategic capacity building will be increasingly essential for sustainable development, for every country on earth, including and most importantly developing countries: "Previous research has focused on developed countries and their applications of open innovation to assist the flow of technology and information among key stakeholders and this concept is beginning to be explored in developing countries."(Pervan, Al-Ansaari and Xu, 2015, p. 1)

D. SMEs and the Triple Helix: Central Role in Actualization in the UAE

For the open/symbiotic innovation model to be fully actualized and effectuated in the UAE, a full appreciation and involvement of small/medium enterprises (SMEs) must occur from the very start. Why is this so important, particularly in the case of the UAE? Astute commentators have observed that SMEs comprise a significant portion of the economic dynamism in the UAE, accounting "for 95% of the total enterprise population in Dubai and employ[ing] approximately 42% of Dubai's workforce." (Hajjiri, Benallal, Ahmad, Ali and Paufique, 2014, p. 16) SMEs will indeed be integral, indispensable components of an enterprising entrepreneurial triple helix system in the UAE, as they represent the nuclear core of innovative energy in the UAE itself:

> The capacity to continually innovate is central to the strategy of Dubai … to position itself as a world hub in commerce and product and service development and it is particularly important as it looks to transition from economic growth based on hard (oil infrastructure) to soft (knowledge infrastructure) products and services. With more than 90% of firms in the Dubai manufacturing and service sectors are … SMEs, it faces the challenge of encouraging innovation in firms that have traditionally been inward focused, competing fiercely but

> locally, with limited innovation outcomes and contributions to the local economy. (Pervan, Al-Ansaari and Xu, 2015, p. 1)

The fundamental importance of SMEs to the triple helix system and the challenges inherent in maximizing their participation are obvious: "SMEs are crucial generators of employment and income, and champions of innovation and growth not only in the UAE but also globally. Despite their impact on and importance for the economy, SMEs are frequently confronted with market imperfections …." (Hajjiri, Benallal, Ahmad, Ali and Paufique, 2014, p. 9) In the context of this article, a "market imperfection" would be loss of opportunity via, e.g., tech-transfer transaction failure due to a general lack of an interconnected innovation ecosystem and a specific dearth of expertise in IP management and tech-transfer capability and capacity; in other words, innovation ecosystem failure. Hence, as Hajjiri et al. further state, "it is important to ensure that the UAE adopts supportive policies and legislative reforms in order to further develop the local economy … providing employment, creating innovation and fostering competitiveness." (Hajjiri, Benallal, Ahmad, Ali and Paufique, 2014, p. 14) Once again we might ask … yes, but how?

Although these commentators primarily address SMEs more broadly in the context of business, employment and finance, the same holds true for SMEs in IP and tech-transfer. This is particularly the case with SMEs in emerging and developing countries in the context of IP management and the open innovation paradigm. In this context, IP is both a tool and asset, used as a form of intangible collateral for finance and transactions. Therefore, among other IP management BP, IP valuation, protection and licensing will be critical for SMEs in emerging economies such as the UAE. This will, in turn, further foster the development of a knowledge-based economy by attracting investment, e.g., venture capital, building public-private partnerships, accessing advanced innovation for assessment, adaptation and development, protecting inventions that flow there from and building a globally recognized intangible asset base. The UAE, at the very cusp of this supremely important endeavour, must therefore make a strong commitment toward strategic and sustainable capacity building and global networking. (Kowalski, 2009)

To realize such a triple helix dynamo in the UAE, with SMEs as key participants (indeed the drivers), more needs to be accomplished. That SMEs are such critical components of the nascent knowledge-based, innovation ecosystem in the UAE is yet to be fully appreciated, particularly in the context of the open/symbiotic innovation paradigm:

> [A]cademic-industry collaborations seem non-significant to SMEs and their innovation processes. … SMEs through the open innovation model can look beyond their internal environment and limited resources for ideas, opportunities and partners. This weak effect suggests that SMEs in Dubai acknowledge the difficulties in accessing qualified manpower to act entrepreneurially and give impetus to the innovation processes. The difficulties arise because of the gaps between graduate capabilities (for example skilled and knowledge workers) at the local academic institutions and the competency requirements of various firms and industries in the market. To this may be added the mismatches between academic institutions outcomes and industrial needs and challenges, a lack of access to academic and research institutions, low participation in collaborative-research and technology transfer activities between academia and industry and the absence of entrepreneurial attitudes and skill development at the local academic institutions to encourage individuals with new ideas to start firms. (Pervan, Al-Ansaari and Xu, 2015, p. 65)

Pervan et al. state that there appears to be a dearth of "attitudes" and "skill" in the UAE. Basic education, although essential, alone will not suffice. "For instance, even though there are high levels of school enrollment and internet use in the GCC, there is also an overall lack in innovation indicators. This suggests that there are particular factors that are unique to the GCC that may be inhibiting the development of knowledge and innovative research and development." (Wiseman, Alromi and Alshumrani, 2014, p. 20) Although the UAE appears to possess a solid education system and corresponding educated population, the cadre of educated ignoramuses it graduates are neither incentivized, properly capable nor possess the capacity to work in the fast-paced, competitive, information-driven, IP-infused global innovation market. The burden of petrol wealth weighs heavily, and must be lifted:

> The notion of resource curse posits a negative relationship between productivity growth and resource richness, the routes through which the capital generated is reinvested, and an apparent lack of focus on innovation and entrepreneurship. This suggests a need for close collaboration with existing educational institutions to design programmes to encourage a proportion of students to start business ventures rather than seeking employment within often saturated public sectors … promoting home-grown business. … The challenge … is to spread these capabilities wider especially to SMEs and the private sector. (Mahroum, Alsaleh and Kanhere, 2013, p. 54)

In the UAE, the realization of SMEs as dynamic components of a robust triple helix can and must be actualized. There are already a few examples, which guide the way and also highlight system deficiencies, suggesting remedies, i.e., strategic and sustainable capacity building, global networking and investments to accelerate the establishment of an appropriate system of BP in the UAE: "A rare example of an innovative SME, incorporating the results of several 'made in the UAE' patents is the floating villa based in Abu Dhabi. However, the lack of government research centres and universities with strong technology transfer systems impedes the growth of the firm and expansion into new markets … and minimal linkages and partnerships that exist between universities in the UAE and private and public sector industries. This is understandable when the oldest university in the UAE is less than 40 years old. This clearly differentiates the UAE from the other innovation- driven economies and is a significant barrier to increasing the number of new and young businesses that are involved in the high/medium tech sector." (Erogul and Horne, 2014, p. 195) The solution to this problem: rapidly establish a world-class triple helix system in the UAE that reaches beyond its borders and region, to every corner of the global innovation market.

V. Strategic Development of a System of Best Practices in IP Management and Tech-transfer for the UAE

For the UAE to build a solid, sustainable and appropriate system of BP in IP management and tech-transfer, the key concept that must be stressed on is that this is fundamentally an issue of development. Ergo, establishing such BP is a task of significant magnitude. Furthermore, the UAE itself must own this initiative. It cannot be effectuated via ad-hoc, expat consultant-driven programs which invest primarily in expensive, impressive real estate in lieu of intangible, yet very real, paradigmatic and transformative societal capacity building. Establishing a true innovation ecosystem, an aspired to and lofty ambition, requires such mundane investment in people and institutions. Ignoring this subtle yet ubiquitous reality will not only lead to loss of wealth but more importantly, loss of opportunity: leapfrogging can go in either of two directions, forward into the new century, or (due to ongoing, e.g., bureaucratic discussions and attendant delays) backwards towards unpredictable scenarios. In addition, each year of delay is magnified by an ever widening gap between developed and developing economies, conservatively measured in the decades (several years of delay equivalent to being several decades further behind). (Economist, 2014)

Sadly, the prevailing trend that exemplifies "development" has become a trap that results in an opposite outcome, a serious problem as the GCC countries grapple with new realities: "The Kingdom of Bahrain is one example of a wider regional trend toward policy borrowing and the importation of foreign systems and practices in education." (Kirk, 2014, p. 129) Aspiration and determination need to be reined in by realistic assessments and strategies: "[A] rapid rate of development and ambition must be tempered with caution, however, as Gulf leaders need to be careful not to go 'too fast and too foreign' in their quest for national development. Locally driven and contextualized models will be a better fit, and *drawing on international best practice and then making it work for the national and local setting will yield, over time, a more effective and sustainable education system.*" (Kirk, 2014, p. 143, emphasis added) Therefore, the Masdar/MIT "partnership" must be viewed with at least a small amount of healthy skepticism. The earnest drivers of knowledge-based development must be the key stakeholders in the process, i.e., the nationals of the country involved, in this case, the people of the UAE.

A. Best Practices in Intellectual Property and Intellectual Property Rights (IP/IPR) Management and Tech-transfer for the UAE

Albeit widely used, the term "best practices" is interpreted in many ways, based on where used, by whom and in what context. For the purpose of this article, we refer to Black's Law Dictionary to initially understand "best practices" as operative legal language:

> "best practice 1. An optimally efficient and effective mode of proceeding or performing a particular activity, esp. in business. 2. A description of such a mode of proceeding or performing prepared so that other people or companies may learn and follow it as a set of guidelines or rules."(Garner and Black, 2014)

With this definition as a point of departure, an outline of BP in IP/IPR management and practice and tech-transfer is summarized herein below. However, their efficacious application to the current circumstances of the UAE tends to be problematic, in that a compendium of BP is only useful when the requisite human capital, institutional infrastructure, policies and legal system are operational. The system of BP for any given country must also be carefully conceptualized in the context of the specific development stage, e.g., whether least developed, developing or in transition. Hence, operationalizing such a dynamic, interconnected, globally-reaching system is the central challenge facing the UAE. As per Garner and Black, "an

optimally efficient and effective mode" of BP must be carefully and thoughtfully nuanced to serve as an applicable guide for the UAE to implement in order to foster a dynamic and sustainable innovation ecosystem.

Pragmatically, the key concept of BP must begin somewhere, i.e., a system of BP cannot exist solely as an abstract concept. It requires a tangible platform which then becomes a base of operations for subsequent capacity building and development initiatives. In the case of the UAE, this should ideally be the public sector, e.g., universities. Therefore, a programmatic strategy is crucial to assist universities in developing their IP/IPR and tech-transfer management capacity. This is necessary for universities to fulfil their vital role in the economic, technological and cultural progress of society and as the bridging link in a globally networked triple helix innovation system. Implementation of the programmatic strategy must prioritize building capacity and capability, i.e., human capital and institutional infrastructure. Technology managers from universities therefore require training in IP and tech-transfer management towards the establishment of TTOs and IP units. This necessarily requires the formalized memorialization of institutional IP policies developed as a baseline for effectuating efficient and appropriate BP. (Kowalski, 2007)

That universities, as central public-sector institutions, should be central to this process of accelerated, transformative development is well established: "The innovative capacity of a country is an important indicator of its overall economic potential. In today's highly globalized and knowledge-based economy, governments and industries are investing heavily in research and development (R&D) activities in order to increase their national competitiveness. As one of the primary sources of generation of new technologies (inventions), universities and R&D institutions increasingly play a crucial role in the process of technological innovation, technology transfer and commercialization of intellectual property (IP) arising from their research activities. Consequently, the effective management of IP and technology throughout the research and commercialization phases has become extremely important for universities." (www.wipo.int/uipc/en)

Operationally, as a starting point to build an appropriate system of BP, a given university should designate a university IP coordinator (UIPC) who will be the key resource for advancing the subsequent implementation of human resource development and related institutional capacity building. In the earliest stages of this process, a comprehensive needs assessment must be conducted. This will determine and prioritize subsequent steps in capacity building. In conducting the needs assessment, information might be gathered via a form (questionnaire), interviews with the UIPC, or by other

independent research approaches. Establishing such a platform to garner useful information will not happen overnight, and implementation might necessitate a coordinated and methodical action plan, possibly over a period of several years to a decade. Building such requisite capacity and capability, via technical training and dissemination of useful information and advice along with strategic network building, must be focused, ongoing and relentless, bringing together diverse communities of interest in order to catalyze the sort of transformation to which the UAE now aspires.

A crucially important early step in building an IP ecosystem that supports and fosters BP is communication. For example, a lead university, possibly via the designated UIPC, must have active and consistent engagement with the various national government institutions (e.g. National IP Office, Ministry of Science etc.). The UIPC can thereby connect university management to the ongoing capacity building initiatives vital for advancing both the human capital and institutional infrastructure which will sustainably embed an appropriate system of BP.

Objectives of a strategically focused capacity building program will thereby accelerate the establishment of IP and tech-transfer management infrastructure via:

1. establishment of TTOs,
2. development of institutional IP policies that foster effective (and appropriate) tech-transfer mechanisms, and
3. promotion and advocacy to increase institutional awareness, viz. the urgency and importance of IP and innovation in national development.

Coordinated and networked training in IP and tech-transfer related topics might include appropriate R&D planning, promotion of the efficient and strategic use of patent information, research collaboration contracts and agreements, identification of IP assets and liabilities (via IP audits), the invention disclosure process, patent drafting, the patent application process, administration of IP legal matters, technology marketing, technology valuation, licensing, commercialization, incubation of start-ups/spin-offs and strategic management and balancing of patents and trade secrets (an oft-overlooked and misunderstood, albeit supremely crucial, aspect of IP management, e.g., hybrid licenses covering both patents and trade secrets) (Jorda, 2007); all of the aforementioned should be in the context of fostering the dynamic facilitation of national and international collaboration, i.e., the open innovation (symbiotic) paradigm.

An important national aspect of such programmatic development will be the creation of an IP and tech-transfer forum for reaching out to other universities in the UAE, e.g., to foster the sharing of information, experiences, and BP and establish a mentoring system. Capacity building efforts must also include global networking for access to advanced expertise, e.g., leading international organizations such as AUTM, WIPO and LESI.

To summarize, successful IP management and tech-transfer towards eventual product/process development and commercialization requires human resources with appropriate expertise, i.e., human capital and institutional infrastructure strategically assembled, organized and trained. Furthermore, in developing countries, the majority of new technology development is carried out in public universities and R&D institutions. Therefore, university-industry collaboration is essential, especially with regard to SMEs. In addition, the active, ongoing and unambiguous involvement of government is essential, which forms the triple-helix system that has proven so successful in many developed countries, synergizing interactions, facilitating transactions and accelerating the development of a sustainable innovation ecosystem. IP and tech-transfer management capacity thus applied and embedded, enables full benefit from IP/IPR assets. As the following sections elucidate, when methodically implemented via application of an appropriate suite of BP, for example licensing, start-ups/spin-offs (particularly as in the case of SMEs), IP/IPR management and tech-transfer can catalyze the transformation of a nation's economic system.

B. Intellectual Property and Intellectual Property Rights

Intellectual property (IP) and intellectual property rights (IPR) are key concepts that form the foundation for any system of best practices (BP). However, although IP and IPR, as complementary intellectual assets, are frequently used interchangeably in articles, legal literature, and even published court cases, it is critical in the context of BP to distinguish the two from each other. A starting point is to articulate that an IPR confers one, and only one, right to its owner: the right to exclude (a "negative right") - and the duty for the others is to forbear, i.e., not use the protected IP in accordance with the law. Therefore, whereas the term IP refers broadly to the creations and inventions of the human mind, IPRs protect the interests of inventors/creators of said IP by providing them with a limited property right. Whereas this might all sound esoteric to the general community, it is a crucial distinction when considered in the context of a sound system of BP.

As defined by Black's Law Dictionary (Garner and Black, 2014), intellectual property is

> A commercially valuable product of the human intellect, in a concrete or abstract form, such as a copyrightable work, a protectable trademark, a patentable invention, or a trade secret. 'While there is a close relationship between intangible property and the tangible objects in which they are embodied, intellectual property rights are distinct and separate from property rights in tangible goods. For example, when a person posts a letter to someone, the personal property in the ink and parchment is transferred to the recipient … [T]he sender (as author) retains intellectual property rights in the letter.' [Black's quoting] Lionel Bently & Brad Sherman, Intellectual Property Law 1–2 (2001).

Therefore, from the very beginning, one must understand and differentiate the concepts of IP and IPR. Although the distinctions might be viewed as subtle, to do so will facilitate management of IP via IPR in a way that ultimately fosters a system of BP that is appropriate, efficient and sustainable.

Table 4: Differentiating Intellectual Property (IP) and Intellectual Property Rights (IPR)

IP	IPR
Inventions	Patents
Proprietary Business Information	Trade Secret
Brands and Logos	Trademarks
Shapes of Items	Industrial Designs
Fixed Works (writing, films, phonographs)	Copyrights
Kowalski, 2009	

To take this concept one step further, we can think of IPR, as bundles of rights capable of being selectively or individually parsed and conveyed: e.g., patent owners can divide their bundle of rights not only into separate exclusive licenses to make, sell, and use the patented item, but also divide each of those into fields of use and/or geographic locality. For example, in an open innovation system, "IPR sticks" forming the "IPR bundle" can be strategically parsed and conveyed via licensing, sublicensing or assignment in order to maximize value, foster and ultimately accelerate the sustainable establishment of an ecosystem for research, development and innovation in a variety of public and private sector business enterprises, which, in the case of the UAE, would necessarily include SMEs. (Kowalski, 2009; Hajjiri et al., 2014)

IPRs are conferred by the state via a number of legal (predominantly statutory) mechanisms. These include:

- Patents
- Industrial designs
- Utility models (sometimes, perhaps derogatorily, referred to as "petty patents" or "innovation patents")
- Copyright
- Trademarks
- Trade secrets
- Plant variety protection

With all of these legal mechanisms of IPR, the key concept to understand is that of ownership rights. For example, an inventor might have been the sole source of conception and reduction to practice for an invention (IP), yet not be the owner (the patentee) of the IPR which protects said invention; the rights could have been assigned to another party or entity (i.e., "successors in title", 35 U.S. Code § 100 - Definitions).

Therefore, a starting point for a system of BP requires an understanding of the fundamentals of this statutory IPR toolbox, how to effectively use these tools and what the range of options might be available in order to maximize value and impact for any given IP asset. From the earliest stages of the R&D process, an informed and strategic management of IP is crucial. Ignorance is not a viable option: verily, capacity building in both human capital and institutional infrastructure is not only fundamental but also requisite for survival in the highly competitive global innovation market economy of the 21st century.

Examples of proactive IP management could include:

- Data protection and exclusivity in pharmaceuticals and agrochemicals
- Patents balancing protection with the public domain (e.g., defensive publication or the erstwhile statutory invention registration)
- Provisional patent applications (remaining cognizant of their advantages and limitations)
- Designing patent applications (e.g., for possible field-of-use licensing)
- Patenting strategies (cost consideration, international patent filing via the PCT)
- Filing international patent applications (risk/benefit and cost considerations in foreign markets and jurisdictions)

- Pyramiding of IPR considerations (e.g., a plant simultaneously covered by trade secret, patent, plant variety protection and trademark IPR)

C. Intellectual Property Management

IP management, as defined in the IP Handbook (Krattiger et al., 2007) is the means by which an institutionally owned IP portfolio is managed with regard to marketing, patenting, licensing, and administration. However, this somewhat terse definition leaves room for further articulation and expansion of key concepts. In a broader context, IP management entails a system of BP for management of an entire suite of intellectual assets, including IP and IPR. This can range from the earliest stage of an invention disclosure to patenting with subsequent licensing of IPR and concomitant royalty-revenue flow. However, such a linear conceptualization of IP management implies a closed innovation system. For the UAE a far more complex, web-like system of open/symbiotic innovation will be optimal for accelerating the establishment of a robust, globally networked knowledge-based economy.

In the context of a system of BP in IP management, contracts and agreements are fundamental for IPR transactions, and this is increasingly the case with the globalized innovation economy as transactions in intangible assets occupy a greater proportion of international commerce. (Baldia, 2013) Such contracts are applicable to a number of possible situations; a system of BP must not only anticipate the basic types of agreements but also how they might be negotiated, drafted and strategically used in tandem. Examples of agreements/contracts include: collaborative research, service, material transfer, confidentiality (confidential disclosure agreement), consultancy, commercialization and, of course of the highest importance, licenses (more precisely IPR license contracts, e.g., granting field-of-use and/or geographic licensing provisions or defining restrictions such as research use license agreements or evaluation licenses allowing a trial period to "test-drive" technologies). Contracts and agreements must clearly articulate provisions with a level of diligence that coherently conforms with internationally recognized and accepted BP, including (but not limited to) obligations, definitions, milestone and benchmarking requirements, ownership of IP, publication restrictions/requirements (including theses and dissertations), tangible and intangible property considerations, conflicts of interest and/or commitment, ownership of equipment, proprietary reach-through rights, issues relating to liability, monitoring, enforcement, and resolving disputes and royalty/revenue management.

All steps in the process and practice of invention disclosure need to be conducted in the context of a carefully crafted, memorialized and implemented system of BP. Among the many aspects of IP management which require a coherent and appropriate system of BP, inventions (as IP) and patents (as the attendant IPR) certainly deserve special mention. This involves, in the early stages, the timely and diligent disclosure of inventions, which is of critical importance as a primary tool of IP management. IP professionals need to understand how to handle a disclosure, particularly as premature disclosure (e.g., to the world) can create possible issues with the subsequent acquisition of patent rights. The obligations of an inventor during and after invention disclosure are also part of the system of BP in IP and IPR management. Additional aspects of invention disclosure and management include managing a confidential disclosure agreement, documentation of inventions (e.g., docket filing system), parsing patentable inventions and trade secrets, early evaluation and valuation of technologies potentially embodied in inventions, clarification of inventorship and ownership of inventions and ultimately the role of the inventor in the tech-transfer process.

BP in IP and IPR management entail many other facets, including IP and information management (libraries, databases, geographic information systems and software), institutional policies and strategies, making the most of IP via the development of institutional IP policies, conducting IP audits, IP portfolio management in the context of open innovation paradigm, freedom to operate (FTO) and risk management, identification and management of genetic resources and biodiversity as intellectual assets, monitoring and guarding IP and IPR assets, selecting and working with external patent counsel and finally, and among the most critical, laboratory notebook policies and guidelines. A common theme running through the BP concepts discussed herein is the importance of information systems and management. In this respect, a concise IP mantra to memorize and repeat is: access to information drives innovation.

D. Technology Transfer

In the overall suite of BP discussed herein, from IP to IP/IPR management and then to tech-transfer, it is the latter which completes the cycle and thereby energizes the innovation ecosystem towards sustainability, analogous to the energy necessary to propel a jet aircraft from runway to cruising altitude and then maintain its velocity and trajectory. Tech-transfer moves beyond the realm of IP and IPR management, securement and protection to the actual use of IPR as a mechanism for facilitating transactions, i.e., to move

and assemble innovation components for a pragmatic purpose. Therefore, as defined by Black's:

> "technology transfer 1. The sale or licensing of intellectual property. 2. The field involving the sale and licensing of intellectual property. Many major universities have an office of technology transfer to control the university's intellectual property and generate income from it."

To presume that the scope of this article could possibly include the plethora of BP in tech-transfer would be presumptuous. Therefore, the reader is referred to the cited materials (IP Handbook, Tech-transfer Tactics, and WIPO) as a second step to appreciate that BP in tech-transfer is a very large, dynamic and intensive field of study and practice.

BP in tech-transfer can be characterized in the context of a hierarchy, that is, from the institutional to the operational levels, with a series of policies, protocols, and procedures which serve as guiding principles. First and foremost, there must be an institutional IP policy in place that includes provisions regarding ownership of IPR, conflict of interest and of commitment in the management of technology transfer, factors to be considered when discussing, negotiating and drafting a licensing agreement, revenue distribution, patenting, confidentiality, and disclosure. A detailed set of guidelines can then build on the IP policy, which necessarily "should be a succinct statement, as opposed to a detailed list of procedures. The latter can be accessed elsewhere, while the IP policy should be the basis of regularly updated IP strategies and serve as a guiding principle for the management of intellectual property." (Kowalski, 2007)

The next level of the tech-transfer hierarchy is the physical, institutional, base of operations: the TTO. In developing countries, establishing and operating a TTO is necessary for the sustained, strategic success of the tech-transfer enterprise (in a narrow context) and the fostering of innovation-driven, knowledge-based development (in the broader context). Therefore, training a critical mass of TTO staff in IP and IPR and related management needs to be a priority. With an established TTO and staff, a subsequent step would be building networks, particularly via the Association of University Technology Managers (AUTM), which supports and enhances the global academic tech-transfer profession via education, professional development, partnering, and advocacy. (http://www.autm.net/)

The TTO's responsibilities and activities lead to the next level in the tech-transfer operational hierarchy: policy, advocacy and fostering the

innovation ecosystem. TTOs in developing countries might be similar in some respects to those in developed countries, yet developing country TTOs' purpose and roles need to be significantly different, to address their special strategic role in transforming the economy, e.g., from commodity to knowledge-based. In addition, although similar in principle to the articulated mission of developed country TTOs not to be primarily revenue generating machines, this is all the more the case in developing countries wherein their primary role must be in the context of development.

Therefore, the TTO takes on the role of an intermediary, and ideally even a catalytic driver, moving IP and IPR to commercial products with societal benefit, e.g., advanced innovations in health, energy, communications and agriculture. The suite of activities is both dynamic and catholic. These can involve:

- administering IPR license agreements
- specific strategies and mechanisms for facilitating access to innovation
- appraisal and valuation of IPR, market evaluation and licensing of IPR
- fostering public-private partnerships (e.g., university-SME collaborations)
- forging commercialization alliances (e.g., once again with SMEs)
- tech-transfer data management
- monitoring, evaluating, and assessing impact
- in-licensing strategies to build an innovation base
- negotiating skills and tactics
- fostering entrepreneurship
- identifying and attracting venture capital (university-VC partnerships can open up opportunities for start-ups)
- faculty outreach and education (crucial for accelerating the establishment of an innovation-IP centered paradigm shift)
- advocating for IP, IPR, tech-transfer legislation (in emerging and developing economies) similar to the Bayh-Dole Act
- elucidating on the proper role of clusters in driving innovation
- exploring public policy options for supporting regional innovation

- cultivating new companies to commercialize IPR, i.e., creating and developing spinouts and startups and formation of business incubators.

BP in patent license negotiations includes preparing to negotiate (assembling a team), exchanging of term sheets, drafting contracts, meeting deadlines. BP also entails valuation approaches, proprietary position, the developmental stage of invention/innovation, exclusivity and field of use licensing, benchmarks, payment terms/royalties, rights to improvements and related reach-through provisions. All of these, and more BP, need to be judiciously established ideally as key operational protocols for nascent TTOs. (Giordano-Coltart and Calkins, 2009)

For the UAE, BP in IP management and tech-transfer must be implemented strategically, with a mix of both caution and boldness, yet tailored to the unique situation and attendant challenges the UAE faces.

> Nations can no longer rely on national resources for economic success. Today the most powerful competitive advantage is brain power. … [Developing countries, therefore, need to turn their] attention to wider educational research and understanding, drawing upon what is perceived to be global best practice and economically rigorous investments in education. However, it must be remembered that borrowing and importation often come at a cost to the receiving nation, not least of all due to clashing issues of suitability and replicability, which often do not happen the way it is hoped. Such a grafting of models and practices can often create the educational equivalent of 'tissue rejection' with local conditions not fully accepting foreign systems. (Kirk, 2014, p. 134)

Note: the overall contents of this section are derived, condensed and then amalgamated from several key cited sources. (Jorda, 2007; Krattiger et al., 2007; Kowalski, 2007; Ku et al., 2008; Tech Transfer Central, 2014)

VI. Ten Prescriptive Recommendations for the UAE

For the UAE to truly undergo a knowledge economy transition, much needs to both happen and also be avoided. In this section, a list of broad and also focused guidelines, divided into fundamentally two sections, i.e., the not-to-do list and then the to-do list, is presented: (1) A broad critique of current paradigms, approaches, and considerations, based on the wisdom of previous commentators and authorities. (2) This is then followed by ten

prescriptive recommendations which are intended to form the foundation for a paradigmatic shift towards strategic implementation of an appropriate and sustainable development action plan for the UAE. A suitable system of BP in IP management and tech-transfer can thereby be conceptualized and then successfully established.

The common concern among the GCC countries is the rapid transition from a petrol, hydrocarbon commodity to an innovation-based economy. However, this is more easily articulated than implemented. Saudi Arabia exemplifies this:

> Overall approaches from the Saudi government to developing human resource skills and enabling economic diversification and growth depend on a series of top-down strategies. These strategies rely on the use of oil wealth to enable major job creation initiatives or the creation of employment and technology zones (such as the King Abdul Aziz City for Science and Technology). These approaches tend to be based on exorbitant levels of spending to create infrastructures and bureaucracies in the hope of promoting economic diversification and human capital development rather than on sustainable approaches that balance government input with localized developmental initiatives. (Patrick, 2014, p. 235)

An appealing concoction of petrol dollars, expensive buildings, useless bureaucrats and overpaid expat consultants is not a sustainably sensible strategy. This presents a policy epitomized by a paradox which promotes negative cash flow, with little to show in terms of sustainable outcomes.

As Patrick further elucidates, the challenges facing Saudi Arabia are many and complex. Perhaps the greatest among these is that a collective paradigmatic shift cannot be accomplished via copious flows of petrol money, extravagant techno-parks, innovation hubs, and highly paid ministers. The change must be fundamental.

> Even if economic expansion and diversification can be accomplished, Saudi Arabia may need to be prepared for any advantages gained to be transitory. The attempt to attain knowledge economy status is indicative of a global tendency for convergence of approaches to education policy and practice. To what extent the government of Saudi Arabia can navigate this tendency while retaining distinctive knowledge traditions remains to be seen if the aim of moving from a rentier state to a globally competitive economy is to be realized. It may well be that, without a concomitant shift towards the cultivation of the individual

> and collective mindsets and cultural habitus on which knowledge creation rests, knowledge economy status will remain elusive. (Patrick, 2014, p. 248)

This situation is ubiquitous among the GCC countries. For example, Bahrain, while having several nascent accomplishments in terms of tech-transfer, follows the petrol-wealth pattern of "development":

> As an example in Bahrain, the seemingly limitless expenditures allocated to building a glittering regional center of corporate finance in Manama, and the drive for extraordinary rates of modernization on the island in general, make this country a key case in point regarding the role of education in the national development agenda of a given country, especially when one considers the fundamental role an expatriate workforce plays in the development of the state. (Kirk, 2014, p. 136)

Transplanting the innovation ecosystem culture of the developed countries into the GCC region is also unworkable. The Masdar/MIT partnership raises this concern, as it appears to engender the tendency of emulation instead of the difficult and complex task of diversification and transformation. When formulating a coherent national knowledge-based development policy and attendant strategy action plan, there are several aspects of this for the UAE to carefully consider. This includes, but is not necessarily limited to, cultural considerations, avoidance of an inappropriate innovation ecosystem model (need for a developmentally appropriate approach suited to the UAE) and also a recognition of the scale and complexity of the challenge the UAE faces in order to rapidly accelerate establishment of a suitable system of BP in IP management and tech-transfer.

Local cultural factors might not be readily considered when initial "capacity building" programs are conceptualized, leading to (at best) transitory/evanescent outcomes or (at worst) animosity towards (culturally insensitive) foreign modes of conducting IP management and tech-transfer. In other words, one cannot expect that everyone and anyone can become another MIT or magically raise a Silicon Valley out of the baking sands of the Rub' al Khali. Such expectations are highly unrealistic, ridiculously impracticable and doomed to disappointment with tragically concomitant lost opportunity. Still and all, such assumptions are often made which might partially explain the poor success outcomes of so many international capacity building initiatives.

When considering capacity building programs in the GCC region,

> [t]he strategy for developing a knowledge society in the Arabian Gulf, therefore, includes building a knowledge economy and transitioning to an Arabian Gulf knowledge society by creating a Gulf-wide knowledge culture that is characterized in several key ways. First, it is responsive to and incorporates Arab and Muslim identity, culture, social mores, and shared expectations. Second, a Gulf-wide knowledge culture is most likely to develop while using science and technology infrastructures to building the capacity for a sustainable transition and eventual change to a Gulf knowledge society. (Wiseman, 2014, p. 279)

In the context of capacity building initiatives which involve multiple international participants, the paradigm must therefore be that capacity building is not unidirectional, e.g., MIT teaches Masdar, but instead reciprocal wherein all parties learn from each other and build appropriate and sustainable innovation ecosystems accordingly. In this respect,

> [i]ndeed, transition to a knowledge society is more likely to occur when the cultural and social conditions that enhance epistemic knowledge cultures and support the development of knowledge communities are encouraged. … . [A] knowledge society is not simply a society of more knowledge and more technology and of the economic and social consequences of these factors. It is also a society permeated with knowledge settings, whole sets of arrangements, processes and principles that serve knowledge and unfold with its articulation. (Patrick, 2014, p. 240)

This is crucially important in all international development scenarios, and perhaps paramount when considering the GCC countries.

When considering capacity building in IP management and tech-transfer, it is critical to recognize that emulation of an ultra-mature institution's operating model might not be applicable to the developmental status of the country wherein the program is contemplated, e.g., the MIT/Masdar partnership endeavor. Paradoxically, there is no such quick fix. Still, action must be taken expeditiously and strategically, as the pace of change in this century will continue to be unrelenting and unforgiving. Bess best frames this in the broader historical context that emphasizes the overall contextual challenges rooted in history and culture, which the UAE (as well as the other GCC countries) currently faces:

> Until recently in human history, the major technological watersheds all came about incrementally, spread out over centuries or longer.

> Think, for example, of the shift from stone to metal tools, the transition from nomadic hunter-gathering to settled agriculture, or the substitution of mechanical power for human and animal sources of energy. In all these cases, people and social systems had time to adapt: they gradually developed new values, new norms and habits, to accommodate the transformed material conditions. But this is not the case with the current epochal shift. This time around, the radical innovations are coming upon us with relative suddenness – in a time frame that encompasses four or five decades, a century at most. (Bess, 2016, p. 35)

The MIT/Masdar partnership endeavor aspires to leapfrog across this unprecedented "current epochal shift", i.e., for Masdar to become MIT-like, a noteworthy goal. When examined in the context of longer-term, sustainable development, the MIT/Masdar partnership approach should be viewed with extreme caution. The programme, albeit appealing, with early "successes", is likely to only be a short-term mirage, much like the vision of an oasis in the sun-parched expanse of the Ad-Dahna desert. Whereas an imitator program such as the MIT/Masdar partnership might, in the short term, appear successful, in the longer term it will likely incur subtle yet very profound and serious opportunity costs. That is, in lieu of dedicated and focused capacity building, mirage-like appearances of progress obscure, obviate and obfuscate dedicated investment towards establishing a robust triple helix system that connects to the global open innovation market.

Therefore, domestic investments in people and institutions are crucial, wherein they take ownership, accept risk, take the lead, and show the way forward:

> [A]s long as the capacity of other NIS [(National Innovation System)] actors in the UAE is not sufficiently leveraged, the role of research universities is likely to be curtailed. To that end, one cannot overemphasize the importance of embracing NIS thinking in national S&T planning and public policy in order to both understand the innovation dynamics of the UAE's local context and guide its transition to a knowledge-based economy … . It is unlikely that these long-term goals will be achieved if the government chooses to continue its over reliance on short-term consultants for policy work. Rather than believing in the principle of 'getting the incentives right and everything will follow', attaining a thorough NIS-based understanding of the status quo should be a policy priority. (Al-Saleh and Vidican, 2011, pp. 28-29)

An ongoing challenge is that senior policymakers appear to largely, and erroneously (perhaps due to ignorance), believe that because the assets of a knowledge-based, innovation-driven economy are intangible, they are therefore not "real" in the same sense as tangible assets (e.g., reinforced concrete, machinery, factories, etc.). This is a serious misunderstanding. There must be a significant and sustained investment in human capital and institutional infrastructure along with relentless network building. The capital assets in a knowledge economy, albeit intangible, are not free. "Intellectual property is people-driven. It is based on the human wealth of a nation which, in turn, is contingent on developing human resources to a degree whereby it is possible to shift into the creation of patents and original works." (Khoury, 2009, pp. 105-107) Such confusion among policymakers creates a chronic fecklessness in setting strategic agendas and a corresponding treadmill of expat expertise and domestic dysfunctionality. "Without operationalizing incentives for interactive, collective learning opportunities as a condition of entry for foreign firms and their workforces, the result is a dual economy: first, a dynamic, market-based economy driven by expatriate labor and knowledge, with little local content; and, second, a distorted, oil-driven public sector which provides employment to the local population." (Ewers, 2013, p. 135) For the UAE, building capacity and capability in both human capital and institutional infrastructure in IP management and tech-transfer, albeit intangible investments, is nevertheless quite real; delays, official inertia and reluctance to prioritize such efforts raises the all too real possibility of catastrophic consequences: state failure. (The Economist, 2017a)

For UAE there are no quick fixes; the country is currently innovation impoverished. A realistic system of BP should focus on the open/symbiotic innovation model. This has been reiterated by commentators: "[G]iven the country's limited technological capabilities and industrialization history, a more realistic target could have been an attempt to adapt foreign technologies to the local context instead of the announced intention of focusing on basic research for technological development." (Al-Saleh and Vidican, 2011, p. 25) In other words, it is critically important to be realistic and not to overstate the potential roles to be played by UAE universities as they are currently configured (e.g., Masdar Institute). Thus, "an emphasis should be placed on the exploration, adaptation, and commercialization of technologies as opposed to generating new scientific knowledge from scratch." (Al-Saleh and Vidican, 2011, pp. 28-29) The open/symbiotic/networked innovation model as a realistic and sustainable development strategy must be taken seriously in lieu of the current UAE "strategy" dominated by gleaming techno-park complexes and (highly compensated) expat consultancies.

A. Ten Prescriptive Recommendations

The UAE has lofty aspirations and for economic diversification, away from a hydrocarbon-based commodity economy, towards sustainable knowledge-based, innovation-driving development. Sadly, progress has been replete with obstacles, misplaced priorities and a generalized ignorance that is likely, at least partially, due to the disproportionate influence of expat consultants "benevolently supervising" the UAE's development. Commentators have noted that many pieces of the innovation ecosystem are lacking; these are critical components akin to gears in an engine, i.e., without which the system simply will not function: "Evidence reveals a positive progression of the UAE in transitioning towards the innovation-driven stage.... However, several issues remain a concern and challenges remain to be addressed. In recent years, the country's economy experienced negative trade trends in foreign technology transfer, exhibited low investments in education and R&D activities and a lack of ability to absorb, adapt and create new technology and knowledge." (Ahmed and Abdalla Alfaki, 2013, p. 98)

Current attempts to build an innovation ecosystem in the UAE are therefore at best ad-hoc, and at worst counterproductive in that they will fail and thereby entail opportunity costs that had not been anticipated. "[I]nnovation can in some ways be boosted over a short period of time, but building the capacity for more radical, sustainable and all-embracing improvement in societies that have achieved high incomes and high costs through other means, requires investment for the long-term and a continuous consistent effort involving all major stakeholders." (IKED, 2010, pp. 144-145). Expansion of innovation requires sustained investment, with a discrete institutional base of operations that serves as the catalytic center for driving the sustainable transformation of the UAE. Nothing less will suffice. Leapfrogging is necessary, i.e., a platform from which to leap, with a carefully conceptualized and strategically formulated action plan.

In this respect, Ahmed and Abdalla Alfaki, in a very broad fashion, note not only the deficiencies and gaps in the nascent UAE innovation ecosystem, but also proffer clear suggestions for moving the country forward. This entails the essential retooling of the workforce via a paradigm-shift in education, training, and overall capacity building, recognizing the pragmatic realities the UAE faces in terms of where it currently is, and where it aspires to go: "The UAE needs to … concentrate on strengthening technical and vocational training and revamping curricula, particularly, a[t] the higher educational level, where learning outcomes should emphasize the promotion of critical thinking skills together with creativity and problem-solving capacities. This is instrumental in providing a highly skilled professional

workforce to counteract the current mismatch in supply and demand in the country's human resources. It is also instrumental in providing R&D manpower required to improve the country's ability to adapt and assimilate new technologies and to develop an innovation base. UAE's investment in knowledge inputs would benefit the country's competitiveness standing and would increase its chances of achieving sustained productivity growth as a result of increasing the indigenous innovation ... ." (Ahmed and Abdalla Alfaki, 2013, p. 98)

Therefore, tersely put, what is the message for the UAE? What steps should be taken to move from policy to strategy to actual tactical implementation? This is the crucial issue which policy-makers, consultants and commentators fail to address. Yes to Ahmed and Abdalla Alfaki's wisdom, but how to proceed is the question? What are the strategic steps to implement? How to move from objective identification of a challenge to pragmatic and strategic capacity building? What follows hereinbelow are discrete, concrete and implementable prescriptive recommendations designed to specifically and methodically outline an action plan to move the UAE forward. These ten recommendations include the establishment of a center of excellence, i.e., an innovation IP hub that the UAE owns, manages and leads. This could thereby become a focal point for coherently strategic capacity building, both of human capital and institutional infrastructure. In this regard, Emiratization is fundamental for sustainable economic diversification in order to survive, compete and prosper in this century.

i. Establishment of a Center of Excellence for IP capacity building

Developing countries urgently need personnel trained in tech-transfer, IP management, information systems and related business, technical and legal disciplines. This will require corresponding institutional infrastructure, both for immediate and then subsequent ongoing capacity and capability building. Therefore, in a nascent innovation ecosystem such as the UAE, personnel resources and talent need to be focused on institutional entities. Whether they are called Centers of Excellence (COEs), Innovation and Technology Entrepreneurship Centers (ITECs), TTOs, IP Hubs (IPHs) or Technology and Innovation Support Centers (TISCs), the fundamental principle is the same, that is, to accelerate knowledge-based, innovation-driven development via the establishment of requisite human capital (a critical mass of knowledge, talent and skills), and institutional infrastructure (a base of operations for a sustainable and long-term strategic development plan). For the purposes of this discussion, the term ITEC will be used as a generic representation of the concept.

To further conceptually illustrate with the gears/machine analogy, the ITEC would be the drive gear in the overall innovation ecosystem, central for interconnecting the component gears and thereby efficiently and effectively engaging and energizing the entire system. For example, IP laws and regulations could be optimally utilized and organized because the human capital and institutional infrastructure would facilitate and catalyze the overall process: "A supportive legal environment is necessary but not sufficient for … effective technology transfer … must be supplemented by the establishment of an [ITEC] to handle … spinning-in, adapting for local use, and spinning-out technology. This organization can either be a newly established entity or an existing unit within an established organization (Inclusive Innovation Center or university technology transfer centers), retrofitted to carry out new functions." (Watkins and Mandell 2010, pp. 20-23)

Similarly, nearly 20 years ago, Maredia et al., proposed an expanded and developmentally conceptualized TTO. As with Watkins and Mandell's ITEC, their approach is consistent with a paradigmatically appropriate role for a developing country wishing to sustainably accelerate the establishment of an innovation ecosystem (e.g., via the open/symbiotic/networked global innovation system): "A framework to allow technology transfer to the public institutes of developing countries must be stimulated and developed. This has been addressed in some countries by the establishment of … TTOs. TTOs are often located in a governmental unit… These offices work with researchers … and with government officials to develop appropriate laws and policies for intellectual property protection. They develop means for providing … invention protection and intellectual property management. TTOs can play multiple roles in research and development (R&D) institutes, [including] protection of intellectual property … revenues through licensing of intellectual property … education and awareness, networking … creation of new start-up companies … institutional policies related to technology transfer [and] service to society." (Maredia et al. 2000, pp. 16-17)

Within the context of the WIPO Development Agenda's pragmatic implementation, this fundamental concept of an institutionalized hub as a focus for IP and tech-transfer capacity building, has also been elucidated:

> [TISCs] act as service-oriented providers to: allow local users to benefit effectively from the increased accessibility of intellectual property information offered by internet searches through direct personal assistance; assist local users in creating, protecting, owning and managing their intellectual property rights; strengthen the local technological base by building up or reinforcing local know-how; and to increase technology transfer, e.g. by investigating the possibilities of

> licensing, joint ventures, etc. In short, TISCs are established so as to act as local drivers of innovation. The training of TISC so as to be able to assist local users and deliver these services is one of the most important elements … and while initial training may be focused on searching patent and non-patent technology databases … further training in other areas of intellectual property rights is considered particularly useful, as it not only continues to develop staff knowledge and their personal development, but also offers a one-stop-shop as regards other elements of intellectual property rights and of innovation support. (Takagi and Czajkowski 2012, pp. 32-33)

As these conceptual models for appropriate institutions illustrate (e.g., ITEC, TTO and TISC), a global innovation marketplace, where "pieces" of a potentially vital technology are scattered, and the technology may be, and verily usually is, under multiple ownership. For complex high technology to be produced (whether in health, agriculture, energy or information technology) numerous inputs might necessarily need to be identified, assembled, accessed and ultimately IP cleared (FTO) for commercial development. For developing countries, when considering such critical innovations and their application, the closed linear approach (as practiced by many developed country research universities and institutes) of R&D-invent-disclose-patent-license-royalty/revenue-repeat is inappropriate and likely disadvantageous (if not dangerous) to emulate, as many components and processes appurtenant to the development of innovations of interest are already in the global innovation marketplace. Hence a broader skill-set in tech-transfer, along with an IP toolbox (Intellectual Property Handbook of Best Practices, 2007) will facilitate transactions in this marketplace, one that will increasingly be driven by an open innovation paradigm. (Chesbrough 2003). Hence, distinct from the methodology of developed country technology-transfer practices, an appropriate institutional framework needs to be established which recognizes that an emerging country, such as the UAE, is in a very different stage of development, thus requiring a very different strategic approach of accelerated establishment of a robust, sustainable, independent and dynamic nationally-led and globally interconnected innovation ecosystem.

The unsuitability of developed country tech-transfer practices to the UAE has been noted, along with the need for more coherent, developmentally appropriate approaches. Albeit lacking strategic specifics, this has nevertheless been alluded to (aspirationally, yet at least attempting to define a path forward):

> [P]revailing research has largely been undertaken in developed markets and thus may not be directly applicable to the emerging Dubai

> market. This … has implications for policymakers and managers. At the policy maker level, there is a need to take further actions to strengthen policy interventions for innovation that are designed to provide supportive institutional arrangements, establish tailored financial programs for SMEs and bring together a network of academics and firms conducting similar projects; for example, the government needs to focus on *catalyzing system-level thinking* through academic and industry forums and to set up mechanisms to encourage research collaboration. If innovation is to succeed in the future, a process of continuous policy and support development, implementation and monitoring needs to be introduced by establishing a national innovation council. It should provide incubator infrastructures, funds, training, consultancy services, networks and technical, legal and market supports for SMEs to stimulate innovations and interactions with both local and regional authorities. Further, policies and infrastructures to stimulate innovations should be encouraged, such as innovation and technology centers, where research outcomes and ideas can be tested. Building a strong local innovation base can position Dubai to rely upon the performance of its innovation outcome in future economic development. (Pervan, Al-Ansaari and Xu, 2015, p. 65, emphasis added)

This would necessarily include focusing on a critical mass of talent, expertise, and capability, wherein an ITEC could be the base of operations to assemble such talent: "[I]n conservative, low risk-taking cultures, such as those typified by countries in the Middle East, a critical mass of entrepreneurs that would change the economic topography does not yet exist. Therefore, education systems should have priority in the transformation process that could gradually modify the traditional mentality into a more business-oriented one, in which greater risk-taking capacity must become an everyday characteristic ... that higher education systems could adapt to enhance the entrepreneurial abilities of students and faculty." (El-Khasawneh and Pech, 2015, p. 499, emphasis added) Note the use of the phrase "critical mass"; hence, a further role of the ITEC is to focus on talent, strategy, and resources. Also note Pervan et al.'s term "catalyzing system-level thinking", which means (plainly) that it must happen rapidly, i.e., now … not five years hence!

The ITEC as a base of operations could also function as a platform for the critical, yet often cautiously avoided, need for cultural paradigmatic transformation. "Excellence centers are of immense importance for developing the right skills, motivation, and sense of direction for both students and

faculty. It is an exchange and learning platform between the three most important players within a country; namely, government, industry, and academia. The excellence centers reduce the risks with maximum benefit to all involved. Business incubators and techno-parks drive knowledge economies and create business and technical dreams for participants and aspirants. This process is – incubation and it is a mechanism that acts as a social and technological haven within a conservative culture in which risk-taking is highly feared and discouraged. Within this mechanism, cultural constraints and bounds are relaxed and people think in a completely different paradigm." (El-Khasawneh and Pech, 2015, pp. 501-502). In addition, the ITEC could serve as an inclusive safe zone, wherein all participants would be able to work as colleagues and build the requisite knowledge, skills, and abilities to develop and then implement an appropriate suite of BP in IP management and tech-transfer. Thus, the changes required to transform the UAE into a truly knowledge-based, innovation-driven economy are significant, far beyond the appearances of the MIT/Masdar joint initiative.

As bona fide innovation development will entail significant shocks to the UAE, the ITEC can also be viewed as a shock absorber that facilitates dramatic economic diversification as it systematically enables societal transformation. The concept of shock has been noted by highly respected commentators: "Attitudes need to change [(paradigms need to expand)], and awareness be raised, to inspire a more appreciative mindset in regard to research, creativity, innovation, and entrepreneurship. ... [D]ay-to-day practices in the vast number [of] ... educational institutions should be subjected to constructive 'shock therapy', to allow reliance on old-style authoritarian practices to be replaced by greater appreciation for the new tools available for the young to seek out and find knowledge in innovative ways, and to inspire more interest in sciences, discovery, development of new technical solutions ... ." (IKED, 2010, p. 10, emphasis added).

Indeed, shock therapy to accelerate development is needed, to open the paradigm for the broadest view possible of the complexity and challenges of building a comprehensive innovation ecosystem, and not only focus on components (e.g., the narrow linear concept of tech-transfer of R&D, invent, patent, license, royalty and possibly protection of IPR via litigation). This is entirely analogous to the well-known fable of the blind men and the elephant, wherein the blind men mistakenly assume that a specific anatomical feature of the elephant is the entirety and not only a single component of a much larger and more dynamic creature … for example, the tusk as a spear, the leg as a tree trunk, the ear as a carpet or the trunk as a hose, etc., i.e., a range of perceptions, misperceptions and alternate paradigms which can

spawn limitations in experience and understanding. It essentially teaches that the reductionist approach to knowledge can severely limit a holistic view of the entirety and thereby cripple progress.

Similarly, IP and tech-transfer are all too often apprehended within a narrow, reductionist paradigmatic context, with the holistic concept of the innovation ecosystem lost in the granular details. Analogizing the blind men elephant fable with narrow perceptions of the global IP/innovation ecosystem, particularly in many developing countries, there is a prevailing preoccupation with facets, e.g., IP valuation, patent thickets, blocking patents, compulsory licensing, patent trolls, patent monopolies (an oxymoronic phrase); or an unrealistic expectation of immediate wealth from IP and tech-transfer such as valuable patents, large licensing revenues or unanticipated financial windfalls. There is a corresponding fundamental lack of appreciation for the greater global IP system and innovation market with its many intricate interconnections, dynamic networks, and limitless opportunities. The IP/innovation global ecosystem is a complex array of interacting players, pieces and possibilities, with IPR and IP treaties/law principally functioning within the system to facilitate arms-length tech-transfer (e.g., licensing deals and fair determination of royalty rates) via the lowering of attendant transaction costs. Therefore, in the context of a development action plan for the UAE, the system needs to be viewed holistically, understood and then tactically navigated consistent with a realistic and appropriate strategy for the country.

That the global innovation economy is complex and multifaceted and must be viewed as a complete system with many interrelated components, needs to be comprehended quickly. Therefore, the role of the ITEC as a base of operations for a critical mass of "shock troops" to build the IP, innovation ecosystem is recommended. A dramatic paradigmatic shift is necessary. Knowledge and innovation in this century are unforgiving and moving forward with exponential speed. One can either catch up or be left behind. Ideally, the UAE should approach this challenge in a methodically strategic and informed manner, such that attendant "shocks" are minimized and the transformation occurs smoothly, successfully and sustainably. "Hopefully someday there will be an epiphany between the media, policymakers, and educational researchers that will eliminate the 'shock' factor and elevate the importance of evidence-based decision-making and reform." (Wiseman, 2014, p. 301)

ii. Female professionals as full participants

If the UAE truly aspires to transform its economy from a hydrocarbon commodity to a knowledge-based, innovation-driven system, significant

paradigmatic shifts are necessary. Principal amongst these attitude shifts is the role of women in the nascent and emerging new UAE innovation ecosystem and its development. Throughout the GCC region, this important, and oft deftly avoided issue presses with greater urgency: "If the encouragement and utilization of skills development in women are not addressed, there is a negative impact on any country's capacity 'to draw on its best talents' and this 'ultimately undermine(s) economic growth and productivity'. However, a sense of artificiality remains with respect to the creation of employment opportunities for women in Saudi Arabia, suggesting that the shift from rentier economy to a global knowledge economy remains elusive for them." (Patrick, 2014, p. 246)

Therefore, for the UAE to accelerate the establishment of an innovation ecosystem, replete with an appropriate, dynamic and fully implementable system of BP in IP management and tech-transfer, there is a crucial need to build human capital. This means mobilizing all human capital in order to provide the UAE with a unique regional strategic competitive advantage as a knowledge-based, globally networked economy. Not including and utilizing the talent, expertise and intellectual power of women in the UAE for knowledge and innovation development would be like, for some bizarre reason, not extracting petrol from fields with reserves known to contain over 50% of the UAE total. This is tantamount to non-utilization of the majority of the natural resources of a country for no apparent reason; in other words, a truly absurd waste of (human) capital. The palpable economic folly that this entails has been analyzed by leading economists and proposed as a fundamental factor hindering the progress of many developing and emerging countries. (The Economist, 2017b)

Noted commentators have advanced this argument, possibly in a more subtle and diplomatic fashion; still and all, the fundamental message is the same, absolutely true and bears to be repeated, repeatedly: "[It] will not be possible to build a knowledge-based economy and a knowledge society without first developing talented citizens [which includes women] in the UAE and ensuring that their knowledge and skills are utilized. In addition, there is a great potential for the government, universities, and industry to collaborate on addressing these issues." (Samulewicz, Vidican, and Aswad, 2010, p. 14) As hinted at by Erogul and Horne, "demographics" must be taken seriously, meaning that there must be female participation and leadership in the nascent innovation ecosystem of the UAE: "The goal of the UAE to become an innovative economy is to maintain competitiveness and sustain innovation rates among Emirati entrepreneurs. To enable this development, the strength and ease of technology transfers, advanced entrepreneurship education, and

networking opportunities ... are crucial. Significant changes in demographics should also be seriously addressed." (Erogul and Horne, 2014, p. 204)

The need to move beyond absolutely economically wasteful gender bias paradigms has been articulated thus:

> Given this growing gender gap, it is vitally important for the UAE's future economy that Emirati females make their way into relevant positions in the labour market. But despite being open to the world, the UAE remains a relatively traditional society, where some citizens still view the primary role of the woman as the family care giver. According to the World Economic Forum's Global Gender Gap Index (which is based on equality in economic participation and opportunity, educational attainment, political empowerment and health), the UAE does the best among Arab countries. But in 109th position out of 136 nations, there is still a long way to go. That said, policymakers are serious about empowering women. Gender equality is enshrined in the nation's constitution, and the UAE is the first country in the Arab world to enforce quotas for women on company boards. It is also on the executive board of the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women). (EIU, 2014, p. 7)

Thus, although the role of women as professionals in the UAE has been somewhat encouraging, particularly in the larger context of the greater GCC region, it is nevertheless still significantly inadequate with regard to advancing the establishment of an innovation-based economic transformation of the UAE. Whereas to some, traditionalism has its presumed benefits, yet also, in this emerging century, it also embodies obvious and onerous costs. In the UAE, this is of particular concern since females academically outperform males, are under represented in the workforce (indicating a large surplus of underutilized intellectual and creative human capital), and have not been coddled and thereby professionally attenuated by public-sector careers as has a large segment of the male population. (Ross, 2008; Parcero and Ryan, 2016; Economist, 2016a)

Therefore, within the greater context of advancing the establishment of an innovation ecosystem in the UAE, and the narrow context of the multiple capacity building and program operations which would be integral to an ITEC, the leadership and professional roles of women will be critically important. As Aswad et al. note, this needs to done systematically to be sustainable, respecting local culture, yet recognizing that the 21st century will necessitate the full mobilization and utilization of all human capital and related institutional infrastructure for UAE to successfully function in the

increasingly dynamic global innovation market: "[W]omen's engagement in STE fields in the UAE ... is based on the assumption that qualifications in these domains are critical for sustaining the transition to a knowledge-based economy. In order for policy guidelines to successfully instigate a broader involvement of women in these fields, it is imperative that strategies reflect the local context. This is critical since a knowledge-based economy can only thrive when the indigenous context is addressed in programmes aimed to build local capacity. Finally, although it is expected that no single intervention can alter women's STE involvement, it is hoped that a gradual implementation of policy changes at different levels may contribute to a greater realisation of the unfulfilled potential of women in these fields." (Aswad, Vidican and Samulewicz, 2011, p. 567)

iii. Global networks

The importance of connecting to the global tech-transfer and IP community cannot be overstated. It must proceed methodically and systematically, such that UAE professionals simultaneously hone skills, build confidence and expand durable and sustainable international networks. This is a self-reinforcing feedback process which forges core competencies and thereby fosters sophistication, credibility, and trust when working in the global innovation market, whether this involves licensing, material transfers, collaborative R&D or patenting.

The ITEC can, therefore, become the operational center for focusing technical and educational programming with organizations whose charge is specifically in the area of IP and tech-transfer capacity building. For example, the ITEC can serve as host for international conferences, symposia, and summits aimed at fostering global IP and tech-transfer professional networks, whilst simultaneously building an ever-strengthening knowledge base to advance the system of BP. Networks established and professional relationships thereby forged will be the foundation for ongoing educational programs, strategic planning, collaborations, and capacity building. These organizations include:

- AUTM, Association of University Technology Managers: AUTM supports and advances academic technology transfer globally. http://www.autm.net
- EPO, European Patent Office: The European Patent Office (EPO) supports innovation, competitiveness and economic growth. https://www.epo.org/index.html

- WIPO, the World Intellectual Property Organization: WIPO leads the development of a balanced and effective international intellectual property (IP) system that enables innovation and creativity across the globe. http://www.wipo.int/portal/en/index.html
- USPTO, United States Patent and Trademark Office: "The USPTO's mission is to foster innovation and competitiveness by: … Guiding domestic and international intellectual property policy [and] Delivering intellectual property information and education worldwide." https://www.uspto.gov
- LESI, The Licensing Executives Society International: encourages high standards and ethics related to intellectual property, including domestic and international licensing of intellectual property rights and transfer of technology. https://www.lesi.org
- CLDP, Commercial Law Development Program, U.S. Department of Commerce: "Working closely with the U.S. Embassies, CLDP has helped develop the legal infrastructure to support domestic and international businesses alike through programs in more than 50 countries."

Dynamic programs which foster linkage to such organizations will catalyze and accelerate the formation of global networks. In the current century, viz. over the next several decades, the pace at which international knowledge-based, innovation-driven interactions and transactions occur will increase exponentially. The complexity of this should not deter bold, yet appropriate and methodical, strategy implementation, as its urgency and importance likewise exponentially increase. "The development of knowledge capacity and national innovation systems is a multileveled process and highly dependent on national context and international relationships. Knowledge enabling, as an extension of knowledge management, is the creation of knowledge through the development of social and institutional relationships and networks." (Wiseman, Alromi and Alshumrani, 2014, p. 24) This is critically important, as linkage to the global innovation market will be integral towards accelerating the establishment of sustainable knowledge-based development in the UAE.

iv. Open Innovation system

To be entirely blunt, the UAE must adopt an open-innovation paradigm in order to rapidly establish a sustainable and dynamic domestic innovation ecosystem that is run by national talent and not "managed" by seemingly well-intentioned expat consultants who seek to transplant mature

tech-transfer systems from, e.g., the USA, into the UAE. Open innovation is the wave of the present and tsunami of the future in terms of how the global innovation ecosystem will operate. Therefore, an appropriate and carefully established set of BP in IP management and tech-transfer must be congruent with the open innovation paradigm.

Open/networked/symbiotic innovation differs from, and is inconsistent with, the time-honored closed innovation system paradigm. Closed innovation is the historically rusting, and increasingly obsolete, paradigm, perhaps best epitomized by the old corporate giants such as Kodak, consisting of an in-house, contained a straight and sequential line from basic and applied research to product development, manufacturing and sales. Open innovation, on the other hand, consists of vigorous networking with other (i.e., external) entities, R&D facilities, interacting with start-up ventures, public research institutes, universities, external suppliers and sharing and accessing outside information and technology. It is far more fluid, adaptable and organic. Dynamism and flexibility are therefore key aspects of open innovation. Hence, open innovation is the appropriate paradigm for innovation deficient (impoverished) developing/emerging countries, e.g., the GCC, to accelerate the establishment of a sustainable and dynamic globally networked innovation ecosystem.

Essential components of open innovation include:

- Networking, building contacts, meeting colleagues, creating opportunities
- Collaboration, working synergistically with partners;
- Entrepreneurship, thinking creatively to find solutions;
- IP management, maximizing value;
- Global Vision, recognizing that the 21st century marketplace is planet earth;
- Knowledge, the key asset in the global knowledge-based economy;
- Access to finance, learning how to be a magnet for investment;
- Access to information, which is the key driver of innovation.

In the emerging global knowledge economy, knowledge itself has become the key resource. Open innovation needs to be embedded in an overall national innovation and IP strategy that emphasizes the interchange of ideas, knowledge, and technology in value creation. In the 21st Century, developing countries cannot expect to do it alone, as contained units. They must

connect to the global network of information, technology, innovation and product development, wherein sophisticated acumen in IP and tech-transfer negotiations and transactions will be crucial. What is needed, therefore, is for the UAE to foster and connect to an integrated global innovation network system, with a suite of knowledge, skills, abilities, and BP which are designed to effectively and efficiently maximize success precisely in this global innovation market. (Kowalski, 2009) This will require fundamental investment in human capital and importantly, infrastructure in order to adjust to this rapidly evolving innovation paradigm: "[C]hanging modes of innovation relying more on sources from outside suggest a need for governments to build socially accessible knowledge infrastructure [human capital and appropriate institutions, e.g., TTOs] as a basis for establishing and promoting markets for technology and licensing." (Lee et al., 2013, pp. 40)

v. Prioritization of innovations of strategic and economic importance

For both the UAE in particular and the GCC region in general, specific technological sectors should be considered and prioritized for investment and development, e.g., solar applications as a targeted strategy. The ITEC would serve as a base of operations for strategic organization and related management of IP and tech-transfer as related to these technology sectors, once again within the context of the open innovation paradigm in order to accelerate identification, access, absorption, adaptation and assembly of necessary innovation components and appurtenant IPRs or IP issues related to tangible property transfers (e.g., material transfer agreements: MTAs).

Tadros has made this point abundantly clear, articulating that "[t]he GCC states should focus the commercialization of research outcomes on areas of strategic importance to them and on providing products, services, and processes, not only to the GCC domestic markets but also to the larger markets of the region and beyond. GCC states should coordinate their STI activities and establish Regional Centers of Excellence for issues of strategic importance such as water desalination, environmental issues, and renewable energy. This will avoid duplication of efforts and enhance regional integration. GCC states should encourage the private sector to invest more in training and capacity building as well as R&D and innovation. There should additionally be more collaboration between universities and research centers and the private sector." (Tadros, 2015, p. 2)

The Regional Center of Excellence referred to by Tadros might be analogized to the ITEC concept proposed herein; furthermore, it might be reasonably inferred that the author supports the proposition that the UAE (along with the other GCC states) should coordinate, manage and drive the process

for its own development, with its own people in charge and not by a cadre of expat consultants and ostensibly well-intentioned "partners", e.g., the Masdar/MIT "collaboration".

Furthermore, Tadros wisely points out that technologies and innovations of strategic importance must necessarily move beyond the narrow suite of sectors that currently predominate in the UAE, that is, those linked to an economic model dominated by hydrocarbon revenue and 20th century convention. For this to occur, sustained and committed capacity building and investment is crucial: "It is of underlying importance to ensure that innovation activities are expanded beyond the presently dominant sectors, i.e. mining, manufacturing, and business services. ... [S]ound governance of innovation policy has now been placed high on the list of overriding policy objectives for Abu Dhabi. It needs to remain there for some time." (IKED, 2010, p. 144-145)The ITEC would be the base for operationalization of said innovation policy for development, beyond high-level aspirations and certainly far beyond prevalent show-case projects, e.g., the Masdar/MIT program (which in many ways is not unlike the astoundingly absurd Ski Dubai) to the hard and mundane work of pragmatic implementation.

Tadros cites several key technology sectors which might be of particular strategic interest for a UAE innovation ecosystem to prioritize, including renewable energy. Interesting, and perhaps ironic given the UAE's relationship with petrol, is this emphasis on energy. Yet, this might not only be creative but also provide a globally recognized advantage for the UAE to establish precisely such expertise. Therefore, the potential of renewable energy sources for the UAE as future prospects for focus might include:

- Photovoltaic energy
- Concentrated solar power (CSP)
- Wind energy
- Hydrogen energy/fuel cells technology energy
- Bio-Fuels
- Biomass energy
- Geothermal energy
- Hydro power
- Wave energy
- Tidal energy

- Ocean thermal energy conversion system (OTEC)
- Solar thermal project
- Solar power for water heating
- Hydrogen power plant (Jamil, Ahmad and Jeon, 2016)

Although handicapped by the resource curse (that is, the so-called "Arab Disease" discussed hereinabove) and all that entails, the UAE is perhaps in a better position than other developing/emerging countries in several important ways, particularly in physical infrastructure and nascent programs which have significant potential if, and only if, the UAE strategically focuses domestic human resources to build human capital and talent in order to sustainably forge a truly UAE driven innovation ecosystem. As articulated by Mahroum, et al, the UAE has indeed "witnessed the mushrooming of institutes of higher education over the last decade, some of which have a strong research component. Growing from only nine universities in 2000, the UAE is now home to more than seventy-five universities and institutions of higher education. As is the case with all countries, however, the UAE cannot afford to specialise across all scientific fields. Most [of] its research and scientific activities have concentrated on key and strategic pockets of science and technology (S&T), such as renewable energy and health sciences." (Mahroum, Alsaleh and Kanhere, 2013, p. 25)

These research programs could represent a launch pad for subsequent intensive, UAE-centric capacity building, which should gradually supplement, and then ultimately replace, what is currently an over-reliance on foreign expat "assistance". Such an over-reliance is strategically unsound and sustainably untenable given the likely permanent drop in global oil prices in what has been termed the "oil price shocks". (Berument et al., 2010) Therefore, the current initiatives can, with guidance from and the involvement of the proposed ITEC, form the basis for rapid expansion of the UAE innovation ecosystem via a more dynamic capacity building program and engagement with the global innovation market through a strategic open innovation paradigm of transactions; a list of current technology/innovation initiatives and projects includes:

- Masdar Institute in the UAE, as already discussed, was launched in 2006 by the Abu Dhabi Government; "an ambitious undertaking to transform the emirate's oil wealth into renewable energy innovation and clean energy leadership … was established through close collaboration with MIT." (Mahroum, Alsaleh and Kanhere, 2013, p. 25) The question which remains is who is actually running this

initiative? Assuming that this is the flagship initiative of the UAE, and that MIT is actually in charge, as might be the case, does this suggest that real capacity building towards a UAE driven innovation ecosystem is occurring; or, as previously noted, is this only a larger, more showy and sophisticated continuation of the expat-driven model of "development"?

- Recent medical innovations in the UAE might be exemplified by the work of the U.S. expat Dr. Samih Tarabichi, who moved his practice from Tampa, Florida to the American Hospital in Dubai, with more than 700 surgeries a year: joint replacements for treatment of the phenomenon known as "Arab knee" or "Middle Eastern knee" by the global community of medical specialists. Whereas most artificial knees have a flexion at a maximum 120 degrees, Dr. Tarabichi (in collaboration with Zimmer, an American manufacturer of orthopaedic products) has developed a knee implant that can bend as much as 150 degrees. (Mahroum, Alsaleh, and Kanhere, 2013, p. 26) This is a praiseworthy and notable accomplishment, by an expat in collaboration with a foreign company. But is it really an example of UAE-driven innovation?

- DUBAL (The state-owned Dubai Aluminium Company Limited, the industrial flagship of the UAE) serves more than 300 customers from 50 countries. Capacity at the plant has expanded more than sevenfold over the past 30 years. Notably as an example of innovation-driven development, DUBAL has a dedicated technology development and transfer department that strives to improve technology and production processes, licenses technology (presumably patent rights as DUBAL appears to have filed, at least six, patent applications over the past two decades) and also provides start-up support and operations, training and skills development. (Mahroum, Alsaleh and Kanhere, 2013, p. 28) As such, DUBAL might represent one of the best examples of a truly UAE managed and led research and innovation enterprise, complete with IP management and tech-transfer expertise and practices along with nascent capacity building efforts.

- A UAE-based enterprise, RAK Ceramics produces a remarkable product: the world's first ceramic tile to reduce microbial contamination and contribute to a healthy environment. To its credit as an exemplary enterprise in terms of global collaboration, RAK has agreements with designers and laboratories in Italy and Spain to support the development of its highly innovative products. RAK Ceramics is therefore somewhat of a model for other organizations in the UAE to

> emulate, i.e., a UAE led enterprise which had established solid global networks, consistent with the open/networked/symbiotic innovation concept. (Mahroum, Alsaleh and Kanhere, 2013, p. 28)

It is therefore crucial, entirely sensible and quite logical for both the benefit of the UAE and the GCC region, that said specific technological sectors should be considered, continue to be cultivated and fostered by the UAE, and those additional sectors should also be considered and prioritized for future investment and development. There is no lack of possibilities, and the candidate list might be organized with respect to several considerations, including, as discussed hereinabove, what is already in place as well as what is of importance to the UAE as well as the GCC region and its environs. Indeed, as Weber has wisely elucidated (albeit for Doha, yet still entirely applicable to the UAE): "The city of Doha is struggling with severe liquid and solid waste management problems due to the tripling of the population and the rapid expansion of the city in the last decade. Prioritized areas that highly impact the nation [and therefore deserve careful consideration include]: water desalination, alternative energy (photovoltaic and concentrated solar power), biofuels, gas to liquids technology, energy and water efficiency, environmental management, genetic diseases, and diseases of affluence (obesity, cardiovascular disease, and diabetes)." (Weber, 2014, p. 66) For the UAE, the ITEC can be the institutional base of operations to facilitate and catalyze similar, critical and appropriate innovative R&D endeavors.

vi. Engage SMEs in the emerging Innovation Ecosystem

SMEs are global drivers of technological innovation and economic development. Perhaps their importance has been somewhat eclipsed by the mega-multinational corporate entities. However, SMEs represent the grassroots dynamism of economic growth, innovation development, and entrepreneurial dynamism. Therefore, as key drivers of technological creativity, SMEs propel long-term growth by facilitating innovation and its diffusion across local, national, regional and international networks and markets. However, innovation immediately implies and involves IP and the concomitant need to address IPRs management and tech-transfer. Hence, to realize the maximum value of innovation, SMEs need to recognize, understand and manage IP in order to accelerate their innovations towards commercialization. This will, in turn, not only improve their business revenue flow, but ultimately raise the standard of living in their respective countries. An understanding of, respect for and capability in BP thus forge an essential link in the economic/technological development chain, between creativity/

invention, on the one hand, and innovation/commercialization, on the other. (Kowalski, 2009)

Therefore, in the context of open innovation, SMEs need to learn about IP BP, to connect to global markets and thereby advance innovation, and tech-transfer. IPRs are thereby not only protected, but are, just as if not more importantly, transferred, licensed, bought and sold and leveraged as a means to maximize value and build a sustainable intangible asset base to foster invention, drive innovation and promote commercialization, i.e., as both tools and assets for lowering transactions costs in tech-transfer and innovation management. The ITEC proposed herein can serve as the educator which builds such capability and capacity into UAE SMEs.

vii. Foster Public-Private Partnerships (PPPs)

Throughout the vast body of prevailing literature relating to IP, its management, tech-transfer, and international development, there is repeated mention of public-private partnerships (PPPs). However, what are PPPs? Comprised of partners from the public (e.g., universities) and private (SMEs) sectors, they typically are shared, collaborative ventures directed towards a common objective (e.g., tech-transfer of drought, insect or heat resistant crops to the Middle East region). Whereas, motivations and expectations of the individual partners likely vary, the shared purpose drives PPP formation and ultimately success. Partners participate in coordinated and cooperative decision making, expertise, resources, contributions and (yes, even) risk (Widdus, 2005). PPPs, therefore, can have a significant impact by facilitating and accelerating access, absorption, adaptation, assembly, and deployment of advanced innovation in developing countries. In addition, as the movement of innovation is global, the need for capacity in IP management and tech-transfer crucial, and the engagement of SMEs integral, recognition of the importance of PPPs in development is correspondingly paramount.

Participants in a PPP might include organizations at all points (logistical, temporal and locational) along the value chain, including developing country institutions, multinational corporations, government laboratories and agencies, universities, suppliers, purchasers, national or international research centers and philanthropic foundations (Gregory et al., 2008). Familiarity with the many parameters that influence IP management tactics and strategy (e.g., information access, assembly and analysis, assessment of markets, evaluation of candidate technologies, knowledge of regulatory landscapes, complexities of tech-transfer and expertise in the practicalities of delivery) enables PPPs to provide dynamic and flexible business models that pool skills, focus funding, and formulate strategy to identify challenges

and overcome bottlenecks. This reduces transaction and opportunity costs that might otherwise obstruct, delay or even prohibit the timely movement of key innovation pieces, i.e., once again within the paradigmatic context of open innovation.

With regard to IP and PPPs, e.g., IPRs and their management should neither be regarded as barriers nor obstructions but rather viewed as a tool to facilitate/accelerate access to and assembly of innovations critical for development. (Wheeler and Berkley, 2001) Hence, a PPP's objective is not (necessarily or solely) to manage IP in the standard context as legal, proprietary means to exclude (and file infringement suits and related legal actions), but rather IP as a means for establishing control, coordinating partners, mitigating risk, lowering transaction costs, defining objectives, sharing outcomes, and accelerating access to the most advanced and appropriate technologies for any given purpose. PPPs, therefore, reconcile the possible divergent IP practices and paradigms of partners, while being compliant with a recognized, fundamental and harmonized system of BP, with benefits to both the private and public sector organizations: for the private sector partner, reducing risks associated with emerging markets as well as creating longer-term access to said markets, and for the public sector partner, advancing food security, energy resources, public health and stabilizing sustainable economic development.

viii. Use information strategically

Access to information drives innovation; albeit a somewhat trite aphorism, it summarizes a critically foundational aspect of a key operation of an ITEC. The term access, as used here, means the ability to rapidly identify, sort, analyze and use complex sets of both patent and technical information (non-patent literature), in order to formulate knowledgeable strategic options towards accelerating innovation development and deployment.

In terms of managing information strategically, patent information and data are essential for accelerating establishment and sustained success of an innovation ecosystem in the UAE. The potential application and use of patent information are quite deep and broad. For example, it can serve as a great resource to identify and target research that is being conducted in the private sector (which is often not published in public resources), stimulate new ideas and importantly prevent the reinvention of the wheel (a painful, and even humiliating, waste of human and financial capital). In general, a patent search identifies relevant categories of patents, pending patent applications, and can be extended into a search of foreign (national or PCT) patent documents and also non-patent literature to effectively complement

patent information. In the context of open innovation, access to information will enable efficient formulation of strategic options, e.g., identifying potential collaborators, optimizing research efforts, categorizing tools/protocols that may hasten or improve product development and launch of a new product to market, determining FTO, where to file a patent application or enforce patent rights.

Furthermore, patent data can be culled and organized from open, web-based patent databases such as the USPTO (http://patft.uspto.gov/), Espacenet (https://worldwide.espacenet.com/), WIPO Patentscope (https://patentscope.wipo.int/search/en/search.jsf), or a variety of proprietary patent database platforms (e.g., Thomson Innovation,http://info.thomsoninnovation.com/). These databases are an invaluable resource, a veritable gold mine of informatics which can be utilized simultaneously for four distinct, albeit in reality overlapping, strategic purposes:

1) From a business perspective, patent information can help develop commercial strategies by monitoring patent portfolios of competing and/or complementary organizations, patent activity in particular geographic markets, and/or estimate the value of patents as well as develop new R&D strategies by identifying new application areas of existing patents, developing new products or improving existing products.

2) From a legal perspective, patent information can help to formulate options as to where to file patent applications (i.e., in which national jurisdictions), enforce or defend rights, ascertain patent ability within the context of patent statutes and/or to facilitate assembly of patent pools. In addition, patent information can also help businesses and lawyers develop an informed licensing strategy and formulate FTO analyses, options and possibly opinions.

3) From a scientific perspective, patent information provides detailed technical explanations of often complex innovations and is complementary to scientific and technical publications (non-patent literature).

4) From a policy agenda perspective, patent information can help determine the level of innovation, degree of foreign investment, and the tech-transfer capacity of a country, e.g., the UAE. For example, the proportion of patent filings in a country from foreign or domestic sources can be determined, thereby inferring the level of innovation in the country's R&D system. This can then guide in institutional and even national science, technology, and innovation policy,

and even help to conceptualize, formulate, and draft applicable and appropriate legislation (e.g., Bayh-Dole-type legislation to facilitate tech-transfer).

Patent searches which are tailored to answer specific questions are generally categorized accordingly:

- Patentability/novelty search
- Validity search
- FTO ("product clearance") search
- File wrapper search
- Assignment/inventor search
- Landscape search

For the UAE, patent landscape searches are fundamentally critical to build its innovation ecosystem, providing data that can serve as a basis for subsequent use and strategic application. As such, patent landscapes represent a key BP to be institutionalized within an ITEC. Operationally, patent landscape searches entail the broadest overview of a given field of technology, and thus create an informational platform that can subsequently be analyzed for other sundry purposes. That patent landscape generation relies on such an eclectic assembly of information sources underscores this. For example, patent landscapes can include search and analysis of relevant patents (active and expired) along with non-patent (technology reports, scientific journals, conference proceedings, dissertations) literature. Therefore, patent landscape searches can be especially useful for technology development or tech-transfer purposes, since they corral a very specific, albeit broad, body of information. Furthermore, patent landscapes can also identify "patent family" information (the global reach of patents), and can thus be extraordinarily useful to formulate commercial, technical as well as strategic options.

Why are patent landscape searches an essential BP for the UAE to adopt? The reason is related to the actual developmental circumstances in the UAE, and the role that patent landscape searches play in building the critical informational component of the nascent innovation ecosystem. Patent landscapes can provide a broad overview of a technology or industry over time and location. Therefore, their application to the circumstances of a developing country needs to be in the context of the open/symbiotic innovation paradigm. A summary of such applications includes:

- Identifying gaps and clusters in technology,

- Developing R&D strategies,
- Identifying new application areas of existing patents,
- Developing a licensing strategy,
- Monitoring patent activity in particular geographic markets,
- Identifying potential competitors,
- And most importantly, identifying possible collaborators or in-licensing, cross-licensing opportunities.

The importance of patent information (and critically cardinal appurtenant non-patent literature) is underscored by the Development Agenda for WIPO. But, one might ask, just what is the Development Agenda for WIPO?

> The WIPO Development Agenda ensures that development considerations form an integral part of WIPO's work. The effective implementation of the Development Agenda, including the main streaming of its recommendations into our substantive programs, is a key priority. The adoption of the Development Agenda was an important milestone for WIPO. The Agenda was formally established by WIPO's member states in 2007, in a decision which included the adoption of 45 Development Agenda recommendations, grouped into six clusters, and the establishment of a Committee on Development and Intellectual Property (CDIP). At the 2007 General Assembly, WIPO Member States adopted 45 recommendations (of the 111 original proposals) made by the Provisional Committee on Proposals Related to a WIPO Development Agenda (PCDA). (WIPO, 2007)

In the 45 Adopted Recommendations under the WIPO Development Agenda, seven either refer directly to, or imply from their language, the critical role of patent information in a dynamic innovation ecosystem (Recommendations 8, 9, 19, 24, 27, 30, 31). To best illustrate: "Recommendation 31. To undertake initiatives agreed by Member States, which contribute to the transfer of technology to developing countries, such as requesting WIPO to facilitate better access to publicly available patent information."

Whereas it might be argued that patent databases and patent informatics are ancillary to policy development, the truth is that poorly informed strategy, particularly in the context of IP, tech-transfer and innovation management, is worse than useless; it is hazardous. Therefore, a key function of an ITEC in the UAE must be the establishment of advanced expertise in patent databases and their judicious use and appropriate application to foster the

development of an innovation-driven, knowledge-based economy and globally networked open/symbiotic innovation ecosystem.

ix. Build the Triple Helix

As the esteemed former President of AUTM, Dr. Ashley Stevens, has so eloquently articulated, "The term 'triple helix' [is] the intertwining of academia, industry, and government to create research driven high technology clusters, a theory of economic development, the cooperation between government, academia and industry in action, dynamic and generating widespread, sustainable and beneficial outcomes and opportunities." (Stevens, 2007) Dr. Stevens' clear and wise exegesis illuminates the catalytic dynamism which a truly operational triple helix encompasses and indeed embodies.

In the UAE, a triple helix system is (at best) nascent. Essential components, along with the vital connections, are simply missing: "an immature innovation system can be depicted, where the UAE lacks a number of crucial pillars such as flows of networks between science and industry, in addition [to questionable] education system quality and postgraduates [with a corresponding] lack of technical people and engineers … ." (Al-Abd and Mezher, 2014, pp. 121)

The establishment of a vibrant triple helix system in the UAE is critically essential because it represents a sustainable systematic strategy for economic transformation:

> "It is no easy task for a state to transform into a knowledge economy, because a successful knowledge economy rests on an intricate relationship between, entrepreneurship, motivation, enabling economic and institutional regimes, and so forth [e.g., the triple helix system]. Establishing a knowledge economy entails much more than just having a well-educated population; it is about a special mindset dominating such societies – a mindset that focuses on building and winning opportunities, on visions, and on creating a vibrant home base for globally competitive business [e.g., a dramatic paradigm shift]. [S]uccessfully establishing a knowledge economy requires a broader change in culture which focuses on citizens' participation (in economic activities), *ownership of processes and active learning* so that motivation, aspirations and entrepreneurship will become an intrinsic ethos of the individual." (Hvidt, 2015, p. 26, emphasis added)

Therefore, the triple helix will verily be the vehicle, driven by UAE IP/tech-transfer professionals (note Hvidt's use of "ownership"), whereby the UAE traverses to this entirely new economic and societal paradigm.

x. Invest in Human Capital development

For the UAE to execute a smooth implementation and sustainable establishment of its IP-related development strategy, education and training of personnel needs to be addressed in a methodical, coherent and practical manner. The ITEC can be the center of excellence which makes this happen. The UAE needs to view building human capital as an indispensable long-term investment, yet highly cost-effective in that it will yield benefits and value far in excess of any initial investment. This, in turn, will foster enhanced ability in licensing and partnership development and thereby catalyze indigenous R&D, tech-transfer and innovation commercialization. Therefore, strategic and practical training programs in BP will significantly stimulate and enhance proactive and efficient management of IP and tech-transfer.

As articulated by Pefile and Krattiger (2007), to ascertain specific needs of personnel, and thereby design educational programs that build appropriate levels of knowledge, skill, ability, confidence and related human capital, the following five questions should be asked and then addressed:

1. What knowledge and skills are required for optimal operation of a technology transfer/IP office and therefore required among the management and administrative staff?
2. What IP related knowledge and skills are required for the research staff?
3. What are the communication gaps with respect to IP both within the institution and with third parties?
4. What are the particular elements of IP policy that seem least well understood and implemented?
5. What resources are required to bring knowledge and skills to the required levels?

In addition, the institutional infrastructure of TTOs, i.e., their personnel organization and operations, will need to be developed such that they are operationally appropriate to the requirement and priorities of the UAE. Organizational charts of TTOs in the developed countries, possibly provided by AUTM, might serve as an approximate guide, a starting point from which to modify and build. This underscores the importance of the

institutional foundation as an anchor for human capital in the UAE, for accelerated sustainable, efficient, appropriate and successful developmental diversification and transition.

Within the context of ITEC operations, education and training programs can also be designed and targeted towards specific constituencies in the UAE, as a means for focused, comprehensive and ongoing development of an innovation conscious, IP aware, entrepreneurially driven UAE workforce, comprised of the best, brightest and most committed women and men. Said constituencies might include researchers, the legal community (lawyers and judges), tech-transfer personnel and managers, government officials and policy makers, business people (e.g., SME personnel) and professors and teachers at all levels. Perhaps most importantly, this must include primary and secondary level school teachers, as the new paradigm of an innovation-driven, knowledge-based UAE must begin with the next generation of the UAE's citizenry, the boys and girls who will become the future leaders of the country and region.

VII. Conclusion

Although the UAE appears to be a country with high potential in science, technology and innovation, potential is still just that- potential. Much more needs to be done to realize such potential, i.e., to make it tangible reality. This has been clearly elucidated by many expert commentators, with the gaps inherent in the system sorely in need of attention highlighted (albeit without any articulation of an action plan to remedy):

> The UAE government should establish a national innovation plan, policy, council, and support program with more attention given to those factors that enhance the technological capabilities. It should provide specific reforms to improve its national competitiveness through innovation in different areas related to technological capabilities. Also to build a strong domestic innovation base, tackling new technological changes and competitive challenges. This will enable the UAE economy to depend on the performance of its national innovation system and its innovation diffusion. … [A]though literacy percentage is remarkable, … efforts must be made by policy makers to elevate the status of research, by spending higher share of the state budget on R&D, and by encouraging scientists for filing more number of patent applications. (Khayyat and Lee, 2015, pp. 216)

How might the UAE, in a truly pragmatic and strategic manner, realize said potential? In other words, how can "should be" become "will do"? The transition towards becoming a knowledge-based, innovation-driven economy can be made, not simply via lofty, inspired and (ostensibly) visionary proclamations, but only by mundane, methodical, and meticulous capacity building. The rapidly increasing systemic complexity of the global innovation marketplace is the unforgiving reality that defines the new century. (Antonelli, 2011; Baldia, 2013) However, the UAE, with its current cadre of professional ignoramuses, albeit "educated", has neither the capability nor capacity to effectively implement a high-level vision for rapid diversification from oil to innovation, in any way approaching a sustainable manner.

As astutely pointed out by Patrick, it is not knowledge per se that builds the knowledge-economy, rather innovative thinking is based on how knowledge is strategically used: "Transformation towards a knowledge economy is not predicated merely on the development of scientific and technical knowledge, but on how groups understand and enact knowledge as process and practice. Shared aims between those who form an epistemic community are also crucial to knowledge generation, as is an individual agency." (Patrick, 2014, p. 241)

Furthermore, advancing knowledge-based development entails a balance, with cultural components recognized, yet not impeding progress, and moving beyond traditional educational systems towards an entrepreneurial and innovative paradigm shift: "Yet, for innovation to occur at a scale where individuals, as well as whole nations, benefit, knowledge development is necessary beyond that which is passively or traditionally transmitted." (Wiseman, Alromi and Alshumrani, 2014, p. 22) This is a step-wise process, leading to new viewpoints and attitudes suited to and appropriate for a dynamic globally innovative century: "As a result, there is a dual approach to knowledge economy development in the Gulf that may address the problem: (1) improve education to deliver knowledge and skills necessary for building human capital (functional) and (2) shift culture of Gulf nationals to embrace capacity building (cultural)." (Wiseman, Alromi and Alshumrani, 2014, p. 18)

Fundamentally, this describes building human capital and institutional infrastructure, i.e. strategic, focused and appropriately applied capacity and capability in IP management and tech-transfer. Such a comprehensive and broad transformation will entail shocks, since it must not only transpire rapidly but also coherently. Establishing a sustainable triple helix system in the UAE will absolutely require the appropriate application of BP in tech-transfer and IP management. The UAE must, therefore, be fully aware

of the challenge and its implications. "[The] UAE government should focus on developing a highly innovative entrepreneurial sector and on supporting high value-added new companies that have the potential to grow and to develop internationally. For this to take place and to create effective support programs that add value, policymakers and business developers need to collaborate with universities and research establishments to develop support systems that work towards supply-oriented policies by focusing on innovation, infrastructure, and ecological sustainability, rather than on the traditional tools of local demand." (Erogul and Horne, 2014, p. 185) Underscoring the fact that a UAE innovation ecosystem can neither exist nor subsist in a vacuum, it is crucial to note that it can only function effectively in a suitable/compatible intellectual/cultural milieu, that is, congruent societal and cultural ecosystems which then foster and provide positive feedback for sustainable transformation. In this regard, the ITEC is the vehicle to move UAE society to that stage of development where informed coordination among all stakeholders (university, government, and private business sector, e.g., SME community) accelerates sustainable progress.

Therefore, the hard work of building an innovation ecosystem, involving disciplined and tactical efforts and investment, is sorely necessary. As with any other large endeavor, it requires commitment and a realistic acceptance of risk. Over-reliance on well-paid expat consultants, and even organizations (such as MIT), which dominate current IP and tech-transfer capacity building initiatives in the UAE, is not a sustainable approach. Their seemingly benign presence only delays the inevitable day of reckoning when the UAE must assume leadership and ownership of its own development, chart the course (verily through uncertain and risky territory) and become the captain of its own destiny. Therefore, the time is nigh for the UAE to build, foster and sustain its own system of BP in IP management and tech-transfer. The global innovation market beckons. The future of the UAE, and quite possibly the entire GCC region, hangs in the balance.

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The Conundrum of Internet Jurisdiction and how Us Law has Influenced the Jurisdiction Analysis in India[1]

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Abstract *This Article examines jurisdiction, in the sense of the competence of the courts from a US perspective in internet cases and compares this with the jurisdictional approach of the courts in India. Both the US and India are common law jurisdictions and since the US has been leading the technological internet revolution it is probably not surprising that Indian courts have been influenced by US legal approaches. At the same time, there are important legislative and constitutional differences in India, which makes it even more interesting to trace this influence in internet cases. The Article focuses on jurisdiction in tort (such as intellectual property and defamation) as well as contractual cases. The article contains a fine grained and conceptualised analysis of the latest case law and critiques some of the concepts, concluding that the "reasonableness" test should act as a filter to prevent jurisdictional overreach without narrowing the minimum contacts test.*

I. Introduction

Traditional jurisdictional principles are now challenged by the increasingly complex commercial arrangements enabled by the internet which means that

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a person does not have to move across a border in order to communicate with a person in another state (whether by distributing products or by accessing them). A further evolution arises from cloud computing technologies which mean that files are hosted and processed in (frequently unknown, domestic or foreign) locations, with the consequence that files and communications are accessed online, but no longer downloaded to a specific user's computer (with a foreseeable location). One of the main advantages of cloud computing is the very fact that files can be accessed from many locations and are not controlled locally. Moreover, businesses do not always specifically target a jurisdiction to transact business and obtain commercially valuable benefits. For many digital content products businesses rely on online profiling of individual customers instead of a geographically based marketing strategy. All these technical developments have an enormous impact on jurisdiction in tort (such as intellectual property and defamation) as well as contractual cases.

In particular, the Article looks at the case law of the US and Indian courts, examining how judges have balanced jurisdictional considerations. The second section examines the general principles and legislation, by way of background in both jurisdictions and juxtaposes the different starting points in each jurisdiction. The third section hones in on the test of minimum contacts under US law, which has influenced the jurisdictional analysis for internet cases in India. The fourth section adds the reasonableness test and explains how this test has been neglected in the US but has also been included in the courts' analysis in Indian cases. The fifth section focuses on the application of jurisdictional principles in the US to internet cases showing the conundrum of balancing the interests of the parties in such cases and then delves deeper in the 2nd aspect of jurisdiction in internet tort cases which has seeped into the minimum contacts analysis: the effects doctrine, which has also been adopted by Indian courts and how this effects doctrine has developed into a targeting test. The sixth section focuses on sketching the case law in India in internet cases, analysing how the minimum contacts doctrine, the effects doctrine and notions of targeting have influenced the balance of factors before the Indian courts. Finally, the conclusion evaluates the approach to internet cases in both the US and India and argues that the reasonableness doctrine should introduce new ways of balancing the interests of the parties and speculates what this means for the analysis before Indian courts.

Both in India and the US, internet cases have been a challenge to the application of jurisdictional principles, as frequently conduct on the internet takes place simultaneously everywhere and nowhere in particular, leaving a

stark choice between the courts having almost unlimited jurisdiction (thus conflicting with other states) or no jurisdiction (leaving the claimant without redress for the injury). This problem becomes apparent in two of the most prominent doctrines applied in internet cases in both the US and India *Zippo* and *Calder* v. *Jones*. The article contains a fine-grained and conceptualised analysis of the latest case law and critiques some of the concepts, concluding that the "reasonableness" test should act as a filter to prevent jurisdictional overreach without narrowing the minimum contacts test.

II. General Principles and Legislative Background

A. The US: Constitutional Due Process Clauses and Long Arm Statues

The different states in the US have varying rules on the jurisdictional competence of their federal and state courts (laid down in so-called "long-arm" statutes, named after the image of a long-arm reaching out and pulling the defendant from his state to the court chosen by the plaintiff (the forum)). Each state's long-arm statute determines the jurisdictional reach of the courts located in that state (both state and *federal* courts).[2] The federal courts are part of a unitary federal system as well as the state court system (diversity jurisdiction), thus conflicts of jurisdiction between federal courts are not a purely administrative question of allocating competence.[3] The ultimate framework for jurisdictional competence of the courts is the Due Process Clause in the US Constitution and it is through this lens that the US rules on jurisdiction must be viewed. The Due Process Clause is contained in the 5th Amendment[4] and 14th Amendment[5] to the US Constitution: "no-one shall be deprived of life, liberty or property without due process of law".[6]

US law does not make a distinction between conflicts of jurisdiction between two sister states and international conflicts of jurisdiction between a US state or federal court, and a foreign state.[7] The general approach to jurisdiction in the US has two arms, one is to ensure fairness to a defendant

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2 *Daimler AG* v. *Bauman*, 2014 SCC OnLine US SC 19 : 134 S Ct 746, 771-2 : 571 US ___ (2014) (Justice Ginsburg).

3 A.T. Von Mehren, D.T. Trautman, *Jurisdiction to Adjudicate: A Suggested Analysis*, (1966) 79 Harvard Law Review 1121-1179, 1123.

4 Federal Courts.

5 State Courts.

6 US Constitution.

7 A.T. Von Mehren, D.T. Trautman, *Jurisdiction to Adjudicate: A Suggested Analysis*, (1966) 79 Harvard Law Review 1121-1179, 1122.

in view of the inconvenience of defending an action in a foreign court, the other is to respect the sovereignty of other states (principle of non-interference under international law). While the internet has exacerbated these concerns, they are by no means new. The US Supreme Court found already in 1958:[8]

> "As technological progress has increased the flow of commerce between States, the need for jurisdiction over non-residents has undergone a similar increase (...) But it is a mistake to assume that this trend heralds the eventual demise of all restrictions on the personal jurisdiction of state courts. Those restrictions are more than a guarantee of immunity from inconvenient or distant litigation. They are a consequence of territorial limitations on the power of the respective States."

A plaintiff can always sue a defendant in the defendant's domicile or place of residence and in *Pennoyer* the US courts have added the mere presence of the defendant in a state for service of process as another ground for assuming jurisdiction over an out of state defendant ("tag jurisdiction").[9]

Moreover, a court is also competent, if the defendant voluntarily consents to the court's assumption of jurisdiction, for example by participating in the process. However, outside four straightforward grounds[10] for assuming jurisdiction over a defendant, residence/domicile, presence, nationality and consent, there are specific federal statutes that provide for the jurisdiction of the US Federal Courts based on the (US) nationality of the plaintiff.[11] If none of these bases for jurisdiction applies, the courts will engage in a due process analysis to decide on jurisdiction.

The due process analysis is based on the test formulated in *International Shoe* where the US Supreme held that a plaintiff had to show that the defendant had "minimum contacts" to the forum state such that the assumption of

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[8] *Hanson* v. *Denckla*, 1958 SCC OnLine US SC 128 : 2 L Ed 2d 1283 : 357 US 235, 250-1 (1958).

[9] *Pennoyer* v. *Neff*, 24 L Ed 565 : 95 US 714, 733 (1877): requiring personal service of process in the forum State; *Burnham* v. *Superior Court of California*, 1990 SCC OnLine US SC 82 : 109 L Ed 2d 631 : 495 US 604 (1990).

[10] See also §421 (2) (a)-(e), (g) and (3) American Law Institute, Restatement of the Law Third Foreign Relations Law of the US, Jurisdiction (1987); A.T. Von Mehren, D.T. Trautman, *Jurisdiction to Adjudicate: A Suggested Analysis* (1966) 79 Harvard Law Review 1121-1179, 1137-8.

[11] For example, in a civil claim arising on the basis of "international terrorism", see Antiterrorism Act 18 U.S.C. §§2333 and 2334(a).

jurisdiction would not offend "notions of fair play and substantial justice".[12] In this case the US Supreme Court found that a Delaware incorporated company with principal place of business in Missouri, which employed around 12 salesmen residing in the State of Washington who regularly solicited business in that state, using samples (only one shoe of a pair) and entertaining some sales rooms there and who were paid a commission, was present and doing business in Washington so that it was liable to pay contributions to the Washington State unemployment fund. The Court (both the majority Opinion[13] and the concurring Opinion[14]) found that International Shoe was essentially carrying on business in the State of Washington which made it reasonable for the courts to assume jurisdiction to determine its contributions to the unemployment fund, despite the fact that its business model was constructed in such a way that the contracts were concluded and orders fulfilled from Missouri. The due process doctrine established in *International Shoe* (minimum contacts and notions of fair play and substantial justice) is now the standard basis[15] for the jurisdictional analysis, including in internet cases in the US.

B. India: Jurisdiction Framework Contained in Legislation

The courts in India face the same challenges of applying traditional common law principles to new technologies, as the courts in the US. As has been found in a decision by the State Consumer Disputes Redressal Commission, "the traditional common law principles of jurisdiction to the border less world of Internet transactions has proved to be very challenging, for the courts and tribunals. It is a technology evolution and a revolution in legal thinking (…)."[16]

However, the first notable difference to the US jurisdictional analysis in India is that jurisdictional principles are codified in different pieces of legislation. Primarily it is the Code of Civil Procedure 1908, but in addition (as *lex specialis*) Section 11, Consumer Protection Act, 1986; Section 62(2), Copyright Act, 1957; Section 134 (2), Trademark Act, 1999; and Section 13, Information Technology Act, 2000 also supplement the same.

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[12] *International Shoe Co.* v. *State of Washington*, 1945 SCC OnLine US SC 158 : 90 L Ed 95 : 66 S Ct 154 : 326 US 310, 316 (1945).

[13] Mr Chief Justice Stone at 320.

[14] Mr Justice Black at 324.

[15] The minimum contacts ruling in the Headnote of West law had been cited 16925 times on 29 October 2018.

[16] *Spicejet Ltd.* v. *Sanyam Aggarwal*, First Appeal No. 515 of 2016 (State Consumer Disputes Redressal Commission, Punjab Chandigarh, 14 March 2017).

Dealing with the provisions in the Code of Civil Procedure 1908 first, a distinction can be made between suits in respect of wrongs to the person or wrongs to movable property which are determined at the place where the wrong was done or at the place where the defendant resides, carries on business or personally works for gain, according to Section 19 of the Code of Civil Procedure.

Next, Section 20, Code of Civil Procedure provides two basic procedural rules as connection factors to determine the competent court in cases of conflict (with variations explained in more detail below): (1) the place of the defendant and, alternatively, (2) the place where the cause of action arises (wholly or in part).

As to the first connecting factor relating to the defendant, this can be the place where the defendant(s) actually and voluntarily resides, or carries on business or personally works for gain. Thus, the first subset of the rule in Section 20 (a) contains three alternative connecting sub-factors related to the defendant, namely residence, carrying on a business or working for gain. The latter two connecting factors (carrying on business and personally working for gain) are less firmly entrenched and arguably can be more temporary and flexible than the first (residence). As will be seen in the discussion in the following sections, the flexibility of the "carrying on business" factor allowed the courts to import aspects of the US minimum contact analysis in internet cases and in particular raises the question whether one can carry on a business remotely without an establishment in the place of the Indian forum applying this rule (which the courts have found through the concept of targeting, i.e., a defendant can carry on business remotely in the forum state if he has targeted transactions remotely there).

As to the second connecting factor, the place where the cause of action, wholly or in part, arises, this has been defined to consist of a "bundle of facts which give cause to enforce the legal injury for redress in a court of law" and that "it must include some act done by the defendant [*in the forum*][17] since in the absence of such an act no cause of action would possibly accrue or would arise".[18] Thus there must be a link between the actions of the defendant and the place of the competent court. Furthermore, while it is sufficient that part of the cause of action arises in the forum state, this part must not be insignificant or trivial.[19] The cause of action connecting factor is also flexible as a principle and has led the courts to consider a variety of connecting

[17] Added for clarification purposes by the author.
[18] *South East Asia Shipping Co. Ltd.* v. *Nav Bharat Enterprises (P) Ltd.*, (1996) 3 SCC 443.
[19] R. Matthan, *The Law Relating to Computers and the Internet* (Butterworths India, 2000) 24.

factors, not dissimilar to the US minimum contacts analysis (discussed in the following sections).

For claims brought in contract, the general rule on jurisdiction is that the courts in the place where the contract was accepted would be competent unless an exclusive jurisdiction clause provides otherwise. In respect of contracts concluded on the internet, remotely, Section 13 (3) of the Information Technology Act provides that an electronic (communication) record is deemed to be received at the place of the business of the addressee of that communication. This would mean that a contract was concluded, and jurisdiction arises at the place of business of the person who receives the acceptance of offer (communication of the acceptance).

Specifically for consumer contracts a claim can be brought in the court where either the claimant(s) or defendant(s) reside, carry on business, have a branch office, or personally works for gain or where the cause of action arises (as long as the dispute is a small claims dispute under a certain value).[20] This provision gives the claimant maximum flexibility in the sense that it relates to a number of different connecting factors, concerning both the claimant and the defendant.

An example for the contractual analysis is *World Wrestling Entertainment Inc.* v. *Reshma Collection*[21] the Delhi High Court found jurisdiction at the place of the buyer's residence, based on a contractual analysis, holding that online communications are instantaneous communications, and that therefore the contract would be concluded at the place where the acceptance is communicated.[22] Likewise, in *MD Air Deccan* v. *Shri Ram Gopal Aggarwal*[23] the claimants sued after they had lost their baggage after a flight and it was held that the courts at the place of the consumer's residence had jurisdiction. In this case, the air ticket had been booked through the internet and the ticket was sent to the claimant by email. The Court held that the booking was the offer and the email constituted the acceptance, as a consequence the contract had been concluded when the acceptance email was received at the consumer's place of residence.

However, in addition to the contractual analysis, Indian courts have taken a holistic view of internet cases and usually place the contractual analysis within the question of where the cause of action arose under Section

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[20] S. 11 of the Consumer Protection Act, 1986.
[21] 2013 SCC OnLine Del 3987.
[22] At para 22.
[23] *M.D. Air Deccan* v. *Shri Ram Gopal Agarwal*, First Appeal No. FA/7/2007 (State Consumer Disputes Redressal Commission, Meghalaya, 7 December 2013).

20 Code of Civil Procedure and examine questions of interactivity and targeting[24] similar to the US Constitutional minimum contacts doctrine at the same time (see further below).

For example, in the case of *Spicejet Ltd.* v. *Sanyam Aggarwal*[25], a flight cancellation case, the State Consumer Redressal Commission considered a number of factors under the question where the cause of action had arisen. It found that the contract had been concluded at the claimant's place of residence because this was where the email containing the airline ticket had been received and where the emails rescheduling/cancelling the flights had been sent. Further, payment for the flights had also been effected at the claimant's residence, so that it could be said that at least part of the cause of action arose there.[26]

Finally, Indian Law contains specific provisions on jurisdiction of the courts in copyright and trademark cases, which privilege the claimant and are therefore considered true long-arm provisions. Section 62 (2) of the Copyright Act 1957 and Section 134 (2) of the Trademark Act 1999 provide that the courts at the place where (at least one of) the claimants actually and voluntary reside, carry on business or personally work for gain. Their impact would be that the claimant can sue at their "local" courts. But these provisions apply in addition to, and as an alternative to Section 20 Code of Civil Procedure and as we will see in Section 6 it is here that the courts have developed an approach analogous to the minimum contacts doctrine.[27]

III. Minimum Contacts under the US Due Process of Law Analysis- Origins of the Principle

The meaning of minimum contacts has been examined in the case law of US courts as the first leg of the due process analysis. The courts examine the defendant's contacts with the forum to assess whether he purposefully availed himself of the privilege of doing business in that state to such an extent that he should anticipate being sued there ("purposeful availment").[28]

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[24] *World Wrestling Entertainment Inc.* v. *Reshma Collection* fn 21.

[25] See fn 16.

[26] At para 40.

[27] *Federal Express Corpn.* v. *Fedex Securities Ltd.*, 2017 SCC OnLine Del 7906, para 12.

[28] *International Shoe Co.* v. *State of Washington*, 1945 SCC OnLine US SC 158 : 90 L Ed 95 : 66 S Ct 154 326 US 310, 321 (1945); *Hanson* v. *Denckla*, 1958 SCC OnLine US SC 128 : 2 L Ed 2d 1283 : 357 US 235, 253 (1958); *World-Wide Volkswagen* v. *Woodson*, 1980 SCC OnLine US SC 7 : 62 L Ed 2d 490 : 100 S Ct 559 : 444 US 286, 297 (1980); *Burger King Corpn.* v. *Rudzewicz*, 1985 SCC OnLine US SC 126 : 85 L Ed 2d 528 : 105 S Ct 2174 : 471 US 462, 474-475, (1985).

The courts assess whether the defendant does business in the forum state by examining whether he has business contacts there[29] or whether he intended to transact with customers in that location.[30]

Furthermore, the courts have found jurisdiction in the so-called "stream of commerce" cases where a manufacturer or distributor of a product or component of a product was held to be able to foresee that the product might end up in the forum state and cause actionable harm there (especially in the case of famous, globally distributed products in product liability cases).[31] Moreover, the courts have found jurisdiction under the minimum contacts doctrine on the basis that the defendant intentionally targeted a tortious action into the forum state, in cases where the defendant could foresee that his intentional conduct would have actionable harmful effects in the forum ("effects doctrine").[32]

Finally, US jurisdictional analysis places heavy emphasis on an intentional element of the defendant's conduct- the defendant must, in some way, have targeted their conduct to the forum state,[33] albeit that different courts have put different emphasis on whether foreseeability *per se* is sufficient or whether something else is required (such as deliberately *aiming* his conduct or activities at the forum).[34] Thus an element of directing or targeting is part and parcel of the minimum contacts doctrine- this is important in particular for internet cases, as it limits (but not eliminates) the possibility that a completely fortuitous connection to the forum leads to a finding of jurisdiction.[35] But as we will see in the next sections the minimum contacts doctrine is

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[29] *Hanson* v. *Denckla*, 1958 SCC OnLine US SC 128 : 2 L Ed 2d 1283 : 357 US 235, 251 (1958): "We fail to find such contacts in the circumstances of this case. The defendant trust company has no office in Florida, and transacts no business there. None of the trust assets has ever been held or administered in Florida, and the record discloses no solicitation of business in that State either in person or by mail."

[30] *McGee* v. *International Life Insurance Co.*, 1957 SCC OnLine US SC 152 : 2 L Ed 2d 223 : 78 S Ct 199 : 355 US 220, 223 (1957) "It is sufficient for purposes of due process that the suit was based on a contract which had substantial connection with that State." (Mr Justice Black);

[31] S. Emanuel, *Emanuel Law Outlines: Civil Procedure* (25th Edition Wolters Kluwer 2015) 9, see *Asahi Metal Industry Co.* v. *Superior Court of California*, 1987 SCC OnLine US SC 17 : 94 L Ed 2d 92 : 107 S Ct 1026 : 480 US 102 (1987).

[32] *Calder* v. *Jones*, 1984 SCC OnLine US SC 58 : 79 L Ed 2d 804 : 465 US 783 (1984).

[33] *World-Wide Volkswagen* v. *Woodson*, 1980 SCC OnLine US SC 7 : 62 L Ed 2d 490 : 100 S Ct 559 : 444 US 286, 295-297 (1980), S. Emanuel, *Emanuel Law Outlines: Civil Procedure* (25th Edition Wolters Kluwer 2015); M. Geist, "Is There a There There? Towards Greater Certainty for Internet Jurisdiction" (2001) 16 Berkeley Technology Law Journal 1345-1406, 1385: describes foreseeability as the "core jurisdictional principle".

[34] *Burdick* v. *Superior Court*, 233 Cal. App. 4th 8 (2015); (2016) 43 Western State Law Review 291-295.

[35] M. Sableman, M. Nepple, "Will the Zippo Sliding Scale for Internet Jurisdiction Slide into Oblivion?" (2016) 20 (1) Journal of Internet Law 3-6, 4; M. Geist, "Is There a There There?

flexible and has thus led to confusing and inconsistent case law in respect of internet cases, which in some cases has led to a wide-jurisdictional reach of the courts and in some cases a denial of access to justice and concomitant uncertainty[36].

IV. The Reasonableness Test

However, the potentially wide aspects of targeting can be compensated for and counterbalanced by the second leg of the due process analysis. The second leg of the due process analysis is an examination of whether the assumption of specific jurisdiction would comport with notions of fair play and substantial justice ("reasonableness test"). This test is not always applied in the jurisdictional assessment, in fact, it is not always explicitly discussed and in most cases, the courts seem to assume that the assertion of jurisdiction complies with notions of fair play and substantial justice. The purpose of the reasonableness test is to temper the heat of the jurisdictional analysis- in a metaphorical sense one could think of this test as a kind of "garam masala" - the beautiful mix of spices added at the end of cooking in some Indian dishes, to rebalance the flavours to the right balance before serving the dish.

In a similar vein, the test has the purpose of finding the right balance between conflicting jurisdictional interests. It weighs up (1) the plaintiff's interest of having justice done[37] and obtain redress, (2) the inconvenience to the defendant of being hauled into a foreign court,[38] (3) the interests of the forum state in adjudicating the dispute,[39] (4) any conflict with the state in which the defendant is a resident, and (5) the practicality of hearing the

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Towards Greater Certainty for Internet Jurisdiction" (2001) 16 Berkeley Technology Law Journal 1345-1406, 1381-1385.

[36] A. Soo Yeon Anh, "Clarifying the Standards for Personal Jurisdiction in Light of Growing Transactions on the Internet" (2015) 99 Minnesota Law Review 2325-2362, 2326.

[37] *Mac Dermid Inc.* v. *Deiter*, 702 F 3d 725, 731 (2nd Cir 2012) citing *Chloé* v. *Queen Bee of Beverly Hills*, 616 F 3d 158, 173 (2nd Cir 2010).

[38] However, the burden to the defendant is only one of several factors, see for example *Mac Dermid Inc.* v. *Deiter*, 702 F 3d 725, 731 (2nd Cir 2012): "the conveniences of modern communication and transportation ease what would have been a serious burden only a few decades ago", citing *Kernan* v. *Kurz-Hastings Inc.*, 175 F 3d 236, 244 (2nd Cir 1999).

[39] See for example *McGee* v. *International Life Insurance Co.*, 1957 SCC OnLine US SC 152 : 2 L Ed 2d 223 : 78 S Ct 199 : 355 US 220, 223 (1957): "It cannot be denied that California has a manifest interest in providing effective means of redress for its residents when their insurers refuse to pay claims." (Mr Justice Black)

dispute in the forum state (for example the location of witnesses[40] and the evidence,[41] or the expertise of the court to deal with disputes of this kind[42]).[43]

In some cases the courts have applied a seven-actor test: (1) the extent of a defendant's purposeful targeting of the forum; (2) the burden on the defendant in defending in the forum; (3) the extent of conflict with the sovereignty of the defendant's state; (4) the forum state's interest in adjudicating the dispute; (5) the most efficient judicial resolution of the controversy; (6) the importance of the forum to the plaintiff's interest in convenient and effective relief; and (7) the existence of an alternative forum.[44]

It is interesting to note here that the "reasonableness test" balances the interests of the parties with the suitability of the forum[45] (akin to elements of the *forum non conveniens* analysis) and with state interests (which is similar to the *comity* or *reasonableness* analysis). Its purpose, therefore, is to blend together, as in my "garam masala" metaphor, a variety of interests of different stakeholders to achieve the most harmonious balance. Frequently, however, the courts have drawn an inference that if the minimum contacts test is passed, that the suit is also reasonable and the courts tend to find that the forum state has an interest in applying its law to foreign defendants.[46]

The relevance of this second element of the due process analysis to internet disputes is that it fits with the argument of those who are concerned that the borderless nature of the internet leads to wide and conflicting assertions of jurisdiction which should be tempered by a reasonableness analysis. This reasonableness test could play a role in achieving this fairness analysis.[47] It

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[40] See for example *McGee* v. *International Life Insurance Co*., 1957 SCC OnLine US SC 152 : 2 L Ed 2d 223 : 78 S Ct 199 : 355 US 220, 223 (1957): "Often the crucial witnesses — as here on the company's defense of suicide — will be found in the insured's locality." (Mr Justice Black) and *Mac Dermid Inc*. v. *Deiter*, 702 F 3d 725, 731 (2nd Cir 2012).

[41] *Feldman* v. *Google Inc*., 513 F Supp 2d 229, 247 (ED Pa 2007).

[42] *Feldman* v. *Google Inc*., 513 F Supp 2d 229, 248 (ED Pa 2007).

[43] *Asahi Metal Industry Co*. v. *Superior Court of California*, 1987 SCC OnLine US SC 17 : 94 L Ed 2d 92 : 107 S Ct 1026 : 480 US 102, 114-116 (1987).

[44] *Burger King Corpn*. v. *Rudzewicz*, 1985 SCC OnLine US SC 126 : 85 L Ed 2d 528 : 105 S Ct 2174, 2185 : 471 US 462, 479; *Panavision International Lp* v. *Toeppen*, 141 F 3d 1316, 1323 (9th Cir 1998).

[45] See also 28 U.S.C. §1404 (a) For the convenience of parties and witnesses, in the interest of justice, a district court may transfer any civil action to any other district or division where it might have been brought or to any district or division to which all parties have consented.

[46] See for example *CompuServe Inc*. v. *Patterson*, 89 F 3d 1257, 1268 (6th Cir 1996) or *Keeton* v. *Hustler Magazine Inc*., 1984 SCC OnLine US SC 57 : 79 L Ed 2d 790 : 104 S Ct 1473 : 465 US 770, 776 (1984).

[47] R.M. Pollack, " 'Not of Any Particular State': *J. McIntyre Machinery Ltd*. v. *Nicastro and Non-specific Purposeful Availment*" (June 2014) 89 New York University Law Review 1088-1116, 1112-16.

examines the positions of both parties and their respective ability to obtain justice if they have to cross a border and the relevant state interests.

Additionally, US law recognizes the common law doctrine of *forum non conveniens*: §304 of the draft (2016) Restatement Fourth states that "a court in the US may dismiss a case if there is an available and adequate alternative forum and (…) the balance of private and public interests favour dismissal".[48] Private interest considerations include convenience to the litigants such as access to sources of evidence, including witnesses and also the enforceability of any judgments resulting.[49] The public considerations relate to interests such as the courts' workload, the need to apply foreign laws to the dispute and how localised the dispute is.[50] For a transfer between two US federal courts *forum non conveniens* has been codified.[51] However, the doctrine has continuing application to cases where the alternative forum is foreign and allows US courts to dismiss a case over which it has jurisdiction otherwise, even before it has decided on the issue of jurisdiction,[52] "when considerations of convenience, fairness and judicial economy so warrant".[53] Under federal law, there is a requirement that the plaintiff has access to an available and adequate forum, where the parties will not be deprived of a remedy or treated unfairly.[54] Expiry of the limitation period in the alternative forum means that this condition is not fulfilled and *forum non conveniens* does not apply in such a case.[55] The US Supreme Court has also held on several occasions that ordinarily if a US court has jurisdiction, the plaintiff's choice of forum should not be disturbed and that the defendant has a strong burden

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[48] Restatement of the Law Fourth – the Foreign Relations Law of the US Jurisdiction, Tentative Draft No. 2 (22. March 2016) §304.

[49] *Gulf Oil Corpn.* v. *Gilbert*, 1947 SCC OnLine US SC 46 : 91 L Ed 1055 : 330 US 501, 508 (1947).

[50] *Ibid.* at 509.

[51] 28 U.S.C. §1404(a) see fn 45 and *Atlantic Marine Construction Co. Inc.* v. *United States District Court for Western District of Texas*, 2013 SCC OnLine US SC 72 : 571 US ___ (2013) : 134 S Ct 568, 580 (2013).

[52] Restatement of the Law Fourth – the Foreign Relations Law of the US Jurisdiction, Tentative Draft No. 2 (22. March 2016) §304 Reporters' Notes p. 127.

[53] *Sinochem International Co. Ltd.* v. *Malaysia International Shipping Corpn.*, 2007 SCC OnLine US SC 15 : 127 S Ct 1184 : 549 US 422, 432 (2007).

[54] *Piper Aircraft Co.* v. *Reyno*, 1981 SCC OnLine US SC 229 : 70 L Ed 2d 419 : 102 S Ct 252 : 454 US 235, 254 (1981); *Gulf Oil Corpn.* v. *Gilbert*, 1947 SCC OnLine US SC 46 : 91 L Ed 1055 : 330 US 501, 506-7 (1947).

[55] Restatement of the Law Fourth – the Foreign Relations Law of the US Jurisdiction, Tentative Draft No. 2 (22. March 2016) §304 Reporters' Notes p.130 citing *Bank of Credit and Commerce International Ltd.* v. *State Bank of Pakistan*, 273 F 3d 241, 246 (2nd Cir 2001); *DiFederico* v. *Marriott International Inc.*, 714 F 3d 796, 801-2 (4th Cir 2013); *Fireman's Fund Insurance Co.* v. *Thyssen Mining Construction of Canada Ltd.*, 703 F 3d 488 (10th Cir 2012); *Chang* v. *Baxter Healthcare Corpn.*, 599 F 3d 728, 736 (7th Cir 2010).

to rebut the presumption that the chosen forum should hear the case.[56] This deference to the plaintiff's choice of forum was never accorded to the same extent to non-US residents- in fact, the US Supreme Court has held in *Piper* that "a foreign plaintiff's choice of [a US court] deserves less deference".[57] But since the doctrine only applies if there is an alternative, available foreign court whose decision will be enforced in the US, it is less concerning than the doctrine of extraterritoriality in relation to its impact on foreign plaintiffs seeking redress before the US courts.

V. Internet cases: subsequent jurisprudence on targeting

The courts, when applying the "minimum contacts" test have almost consistently found that mere access to a website is not sufficient as a basis for finding personal jurisdiction, but that "something more" is required.[58]

This something more is the targeting approach under the minimum contacts doctrine discussed above, the defendant must have purposefully directed conduct towards the forum residents, in such a way that it can be said that "the defendant makes the choice to dive into a particular forum".[59] Defining this "something more" has proved to be highly elusive and has resulted in different, overlapping jurisdictional tests being applied to internet jurisdiction cases.

In tort cases concerning data "theft", privacy invasion and computer misuse (illegal access to and misuse of personal information), the question arises whether the location of the data, *i.e.* the place where the data is physically stored is relevant for the jurisdictional analysis. The courts have found jurisdiction on the basis that the defendant knew that the email servers she used and the confidential files she misappropriated were centrally hosted at her

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[56] *Piper Aircraft Co.* v. *Reyno*, 1981 SCC OnLine US SC 229 : 70 L Ed 2d 419 : 102 S Ct 252 : 454 US 235, 255 (1981); *Sinochem International Co. Ltd.* v. *Malaysia International Shipping Corpn.*, 2007 SCC OnLine US SC 15 : 127 S Ct 1184 : 549 US 422, 430 (2007); *Gulf Oil Corpn.* v. *Gilbert*, 1947 SCC OnLine US SC 46 : 91 L Ed 1055 : 330 US 501, 508 (1947).

[57] *Piper Aircraft Co.* v. *Reyno*, 1981 SCC OnLine US SC 229 : 70 L Ed 2d 419 : 102 S Ct 252 : 454 US 235, 256 (1981), see also the discussion in Restatement of the Law Fourth – the Foreign Relations Law of the US Jurisdiction, Tentative Draft No. 2 (22 March 2016) §304 Reporters' Notes p. 131.

[58] *Cybersell Inc.* v. *Cybersell Inc.*, 130 F 3d 414 (9th Cir 1997).

[59] W.F. Patry, "Section 17:185 The Internet and Personal Jurisdiction Generally", *Patry on Copyright* (March 2017 Update Westlaw), see also *Qwest Communications International Inc.* v. *Sonny Corpn.*, 2006 WL 1319451 (W.D. Wash. 2006).

former employer's place in Connecticut.[60] As data is increasingly stored on remote cloud computing servers it is unlikely that defendants know where those are located, so that the courts are more likely to focus on the location of the plaintiff as the location of the injury, especially where the defendant was in direct contact with the plaintiff.[61]

The common approach of the courts is to insist on a degree of foreseeability and deliberate conduct to provide a connection with the forum state. One of the first US Supreme Court cases which elucidated this approach was *World-Wide Volkswagen Corpn.* v. *Woodson*[62] a personal injury case, where the defendants had driven a car across the USA and had an accident in Oklahoma, allegedly due to a defect in the car. The defendants, the distributor and the retailer of the Audi car, had sold the car in New York state and had no business contacts as such with Oklahoma. But the plaintiffs nevertheless filed their claim in Oklahoma and the US Supreme Court held by a majority[63] that theoretical foreseeability on the part of the defendants that someone might drive a car to Oklahoma and have an accident there (cars being inherently highly mobile consumer goods) was not sufficient for a finding of minimum contacts, and that the defendant's contacts with the forum must be more than fortuitous (fortuitous in the sense that this was where the harm happened). Under the US doctrine, the driving to Oklahoma would be regarded as a unilateral act of the plaintiffs, which cannot be imputed to the defendants.[64]

However, the US Supreme Court has held that for jurisdiction over a defendant to exist, the defendant need not have physically entered the forum state at any point- mere regular dealing and contractual relationships (including an express jurisdiction clause in a franchising contract) are sufficient:[65]

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[60] *Mac Dermid Inc.* v. *Deiter*, 702 F 3d 725, 730 (2nd Cir 2012) (computer misuse and misappropriation of trade secrets): "Deiter purposefully availed herself of the privilege of conducting activities within Connecticut because she was aware 'of the centralization and housing of the companies' e-mail system and the storage of confidential, proprietary information and trade secrets' in Waterbury, Connecticut, and she used that email system and its Connecticut servers in retrieving and emailing confidential files."

[61] *Microsoft Corpn.* v. *Mountain West Computers Inc.*, 2015 WL 4479490 (US District Court W.D. Washington 2015), p. 7: "Regardless of whether Defendants knew where Plaintiff's servers were located, Defendants admit that they knew Microsoft is located in Washington. Even though Defendants' contacts with Plaintiff were made remotely, they knew Plaintiff to be located in and operating out of the State of Washington." (copyright infringement action concerning allegations of the use of unlicensed software)

[62] 1980 SCC OnLine US SC 7 : 62 L Ed 2d 490 : 100 S Ct 559 : 444 US 286 (1980).

[63] With a strong dissent by three Judges: Justices Marshall, Blackmun, Brennan.

[64] At 295-298.

[65] *Burger King Corpn.* v. *Rudzewicz*, 1985 SCC OnLine US SC 126 : 85 L Ed 2d 528 : 105 S Ct 2174, 2185 : 471 US 462, 479.

> "It is an inescapable fact of modern commercial life that a substantial amount of commercial business is transacted solely by mail and wire communications across state lines, thus obviating the need for physical presence within a State in which business is conducted."

A much-cited first instance, 1997 US District Court case Zippo[66] established the parameters for internet cases by defining what intentional conduct and business contacts sufficient for the establishment of jurisdiction means. The case is a domain name dispute alleging trademark infringement and dilution brought by the manufacturer of *Zippo* lighters (based in Pennsylvania) against an internet news portal (based in California). *Zippo* set out a test distinguishing between merely passive websites which do no more than host information which can be accessed online at one end of the spectrum (no jurisdiction[67]) and fully interactive, fully e-commerce enabled websites which are virtual shopfronts allowing transactions to take place at a distance (jurisdiction would be proper if the defendant actively conducts business over the internet, thus establishing electronic contacts[68]). For the websites in the middle of the continuum, the degree of interactivity is decisive. Thus, the Court developed the so-called sliding scale which requires the court to assess the degree of interactivity of a website in order to see where on the scale the website is situated, based on the notion that "the likelihood that personal jurisdiction can be constitutionally exercised is directly proportionate to the nature and quality of commercial activity that an entity conducts over the Internet."[69] In the actual *Zippo* case, the Pennsylvanian court found that it had jurisdiction since the defendant was doing business over the internet, allowing people to subscribe to its newsgroup services over the internet and 2% of its customers were resident in the forum state.[70]

Zippo has been preceded by cases where the courts had found *specific* personal jurisdiction grounded on (1) the defendant doing business in the forum over the internet and (2) regarding repeated electronic contacts with the forum as the "minimum" contacts required. For example, in *CompuServe Inc.* v. *Patterson*,[71] *Mr Patterson*, a lawyer based in Texas, distributed a software developed by him as shareware through *CompuServe's* platform. The contract with *CompuServe* stipulated Ohio law as being applicable to the contract but had no express jurisdiction clause. When he alleged that *CompuServe* infringes his trademark/engaged in unfair competition,

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[66] *Zippo Mfg. Co.* v. *Zippo Dot Com Inc.*, 952 F Supp 1119 (WD Pa 1997).
[67] See also *Bensusan Restaurant Corpn.* v. *King*, 937 F Supp 295 (SDNY 1996).
[68] See also *CompuServe Inc.* v. *Patterson*, 89 F 3d 1257 (6th Cir 1996).
[69] At 1124-1125.
[70] At 1126.
[71] *CompuServe Inc.* v. *Patterson*, 89 F 3d 1257 (6th Cir 1996).

they quickly filed for a declaration that their product does not infringe *Mr Patterson's* rights, in their local courts in Ohio. The Court found jurisdiction on the basis that *Mr Patterson* had repeatedly uploaded his software to the platform of an Ohio based company, that he must have known that this company was in Ohio, it was an ongoing business relationship which had lasted for three years and that these repeated electronic contacts are sufficient for a finding that he purposefully availed himself of the privilege of doing business in Ohio.[72] It is peculiar that one of the supporting grounds for jurisdiction was that *Mr Patterson* had addressed email and correspondence to *CompuServe* in Ohio concerning his trademark/unfair competition infringement claims.[73] This is peculiar as it raises the question of how else would any plaintiff send a letter before action to the other party so that this ground always exists in any dispute.

The sliding scale test established in *Zippo* has been applied in a number of cases following it, which examined the degree of interactivity of a website and depending on where on the scale a case was held to sit, jurisdiction was either found[74] or denied.[75] Indications for a high degree of interactivity were held to be a website were users could affect an initial loan application, chat online with an employee of the bank and send an email where a response rate of an hour was guaranteed[76] or where customers could buy a fitness shirt (a fitness app) through the website, allowing for communication and inviting potential customers to contact the company[77] or where customers could select "Utah" from a drop down menu, indicating that the website was interacting with customers from that state.[78]

Insufficient interactivity was held to be a website that merely posts information about the defendant's products and contains a printable mail-order form, telephone number and email address, when orders were not taken through that website and there was no sign that the defendant conducts

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[72] At 1263-4, quoting *Burger King Corpn.* v. *Rudzewicz*, 1985 SCC OnLine US SC 126 : 85 L Ed 2d 528 : 105 S Ct 2174 : 471 US 462, 474-75 (1985).

[73] At 1266.

[74] *Citigroup Inc.* v. *City Holding Co.*, 97 F Supp 2d 549 (US District Court SDNY 2000); *Sarvint Technologies Inc.* v. *Omsignal Inc.*, 161 F Supp 3d 1250 (US District Court ND Georgia 2015); *Zing Bros., LLC* v. *Bevstar, LLC*, 2011 WL 4901321, (US District Court Utah 2011).

[75] *David Mink* v. *AAAA Development, LLC*, 190 F 3d 333 (5th Cir 1999); *Best Van Lines Inc.* v. *Tim Walker*, 490 F.3d 239 (2nd Cir 2007); *Oldfield* v. *Pueblo De Bahia Lora, SA*, 558 F 3d 1210 (11th Cir 2009); *Millenium Enterprises Inc.* v. *Millenium Music LP*, 33 F Supp 2d 907 (United District Court Oregon 1999).

[76] *Citigroup Inc.* v. *City Holding Co.*, 97 F Supp 2d 549, 565 (SDNY 2000)

[77] *Sarvint Technologies Inc.* v. *Omsignal Inc.*, 161 F Supp 3d 1250, 1259 (US District Court ND Georgia 2015).

[78] *Zing Bros., LLC* v. *Bevstar, LLC*, 2011 WL 4901321, at *3 (US District Court Utah 2011).

business through the internet[79] and the posting of allegedly defamatory comments on a feedback website about home removal businesses.[80]

Even though the 1997 *Zippo* has been described[81] as "seminal authority regarding personal jurisdiction based upon the operation of an Internet web site". In recent cases[82] and literature,[83] it has also been described as obsolete, as contemporary websites are unlikely to be purely passive websites, only hosting information, but most websites allow for highly interactive communications and allow the defendant to conduct business transactions remotely:

> "Virtually all websites, even those created with only minimal expense, are now interactive in nature. It is an extraordinarily rare website that does not allow users to do at least some of the following: place orders, share content, "like" content, "re tweet," submit feedback, contact representatives, send messages, "follow," receive notifications, subscribe to content, or post comments. And those are only interactions immediately visible to the user. In fact, most websites also interact with the user "behind the scenes" through the use of "cookies."[84]

It is no understatement to say that the very essence of the internet is interactivity in communications, marketing and business conduct- which makes this an unsuitable factor for determining specific jurisdiction. It is also not

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[79] *David Mink* v. *AAAA Development, LLC*, 190 F 3d 333, 337 (5th Cir 1999).

[80] *Best Van Lines Inc.* v. *Tim Walker*, 490 F 3d 239 (2nd Cir 2007).

[81] *Toys "R" US Inc.* v. *Step Two SA*, 318 F 3d 446, 452 (3rd Cir 2003).

[82] *Toys "R" US Inc.* v. *Step Two SA*, 318 F 3d 446, 452 (3rd Cir 2003); *Kindig It Design Inc.* v. *Creative Controls Inc.*, 157 F Supp 3d 1167, 1173-75 (US District Court Utah 2016); *Caiazzo* v. *American Royal Arts Corpn.*, 73 So 3d 245 (District Court of Appeal of Florida 2011); *Hy Cite Corpn.* v. *Badbusinessbureau.com, LLC*, 297 F Supp 2d 1154, 1160 (W.D. Wis.2004); *Carlson* v. *Fidelity Motor Group, LLC*, 860 NW 2d 299, 305 (Wis. Ct. App. 2015).

[83] Justice S. Muralidhar "Jurisdictional Issues in Cyberspace" (2010) 6 The Indian Journal of Law and Technology 1-42, 15; K.A. Meehan "The Continuing Conundrum of International Internet Jurisdiction" (2008) Boston College International and Comparative Law Review 345-369, 357-358; H. Hestermeyer "Personal Jurisdiction for Internet Torts : Towards an International Solution" (2006) 26 Northwestern Journal for International Law & Business 266-288, 278; F. Fangfei Wang, *Internet Jurisdiction and Choice of Law : Legal Practices in the EU, US and China* (Cambridge University Press 2010) 70; M. Geist, "Is There a There There? Towards Greater Certainty for Internet Jurisdiction" (2001) 16 Berkeley Technology Law Journal 1345-1406, 1371; R.M. Pollack, " 'Not of Any Particular State': *J. McIntyre Machinery Ltd.* v. *Nicastro and Non-specific Purposeful Availment*" (June 2014) 89 New York University Law Review 1088-1116, 1101; M. Sableman, M. Nepple, "Will the Zippo Sliding Scale for Internet Jurisdiction Slide into Oblivion?" (2016) 20 (1) Journal of Internet Law 3-6, 3; B.D. Boone, "Bullseye!: Why a 'Targeting' Approach to Personal Jurisdiction in the E-commerce Context Makes Sense Internationally" (2006) 20 Emory International Law Review 241-278, 257-8

[84] *Kindig It Design Inc.* v. *Creative Controls Inc.*, 157 F Supp 3d 1167, 1174 (US District Court Utah 2016) US (District Court Judge Jill N Parrish).

very sensible to merely focus on the nature of the website in "internet cases" and ignore the nature of the underlying dispute and basis of the claim (breach of contract, misleading online advertising, trademark infringement, privacy, defamation etc).[85]

Moreover, it is not necessarily clear why the degree of interactivity of a website is supposed to be decisive and not an assessment of the defendant's conduct as a whole. Furthermore, if the defendant actively aims harm into the forum through the publication of defamatory contents i.e. the publication of information, classified as passive under the *Zippo* sliding scale, it does not make sense to focus on the degree of interactivity of the website. Conversely, a website can be highly interactive but target only local residents (such as the website of a local take-away restaurant for example).[86]

Therefore, *Zippo* has not clarified what the "something more" is, which is required to subject a defendant whose website can be accessed in the forum state. This means that there is a likelihood of highly inconsistent and uncertain case law.

Pollack[87] cites a number of US court decisions in which purchasers of vintage cars and paintings acquired on eBay sued sellers in their local jurisdiction- the courts came to different conclusions whether the buyers' courts had jurisdiction[88] or not.[89]

Not all courts rely on *Zippo* and instead apply a multi-factor test to assess minimum contacts. In particular, the courts have decided the question of whether the defendant has minimum contacts in the sense of transacting business in manifold ways.[90] For example, some courts have held

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[85] M. Sableman, M. Nepple, "Will the Zippo Sliding Scale for Internet Jurisdiction Slide into Oblivion?" (2016) 20 (1) Journal of Internet Law 3-6, 4.

[86] See also *Kindig It Design Inc.* v. *Creative Controls Inc.*, 157 F Supp 3d 1167, 1173-75 (US District Court Utah 2016).

[87] R.M. Pollack, " 'Not of Any Particular State': *J. McIntyre Machinery Ltd.* v. *Nicastro and Non-specific Purposeful Availment*" (June 2014) 89 New York University Law Review 1088-1116, FN 76.

[88] *Erwin* v. *Piscitello*, 627 F Supp 2d 855, 856 (E.D. Tenn. 2007): jurisdiction based on telephone calls and making use of the internet for business contacts directed at Tennessee; *Dedvukaj* v. *Maloney*, 447 F Supp 2d 813, 816-7 (E.D. Mich. 2006); jurisdiction based on transaction of business in Michigan through email messages and telephone calls, accepting the winning bids in the eBay auction, confirming shipping charges to Michigan and accepting payment and the degree of interactivity of the eBay auction website.

[89] *Boschetto* v. *Hansing*, 539 F 3d 1011, 1014 (9th Cir 2008): single eBay sale with buyer in California insufficient to establish jurisdiction over Wisconsin seller: "once the car was sold the parties were to go their separate ways"; *Hinners* v. *Robey*, 336 SW 3d 891, 893 (Ky 2011).

[90] K.D. Johnson, "Measuring Minimum Contacts over the Internet: How Courts Analyze Internet Communications to Acquire Personal Jurisdiction over the Out-of-State Person"

that a single negotiation process or entering into a single contract is sufficient where the communication was targeted at a particular state.[91] In *Deutsche Bank Securities Inc.* v. *Montana Board of Investments*[92] the New York Court of Appeals, for example honed in on the fact that the defendant (based in Montana) had initiated a new set of negotiations with the plaintiff (whose principal place of business in New York was known to the defendant) through instant messaging. Thus, the fact that the MBI had reached out to a New York investment bank was seen as sufficient for jurisdiction in New York. By contrast in other cases, the courts have held that there must be a course of business transactions targeted at a particular state and a single transaction is not sufficient.[93] Sometimes the courts examine fairness arguments in addition to the nature and quality of the contacts, considering the nature of the parties involved (protecting consumers and individual investors) as part of the minimum contacts analysis.[94] One specific emanation of the minimum contacts test will be discussed next.

In the seminal defamation case *Calder* v. *Jones,* the US Supreme Court[95] established the so-called *effects test*. In this case, a Californian entertainer brought an action for libel in California against the writer and the editor of a Florida based magazine, the National Enquirer.

In some ways the label given to the *Calder* v. *Jones* test is a misnomer, as jurisdiction under this test is not grounded on harmful "effects" within the forum state alone but on the defendant purposefully targeting their tortious conduct to the forum state, in such a way that the brunt of the harmful effects were caused there and this was foreseeable for the defendant (as the plaintiff lived and worked there and the magazine had its largest circulation in California).[96] The Court in *Calder* v. *Jones* concluded:

> "the allegedly libelous story concerned the California activities of a California resident. It impugned the professionalism of an entertainer whose television career was centred in California. The article was

(2007) University of Louisville Law Review 313-333, 325-331.

91 *Chloe* v. *Queen Bee of Beverly Hills*, 616 F 3d 158, 165-167 (2nd Cir 2010) (one shipping of a counterfeit bag to plaintiff's lawyers in New York sufficient — as part of other contacts with New York which demonstrated a larger business plan directed at customers in New York).

92 850 NE 2d 1140 (NY 2006).

93 *L.F. Rothschild* v. *McTamney*, 449 NE 2d 1275 (NY 1983): call by an individual investor to a New York stockbroker not sufficient for jurisdiction in New York; *Boschetto* v. *Hansing*, 539 F 3d 1011, 1014 (9th Cir 2008).

94 *Dedvukaj* v. *Maloney*, 447 F Supp 2d 813, 822-3 (ED Mich 2006); *L.F. Rothschild* v. *McTamney*, 449 NE 2d 1275 (NY 1983).

95 1984 SCC OnLine US SC 58 : 79 L Ed 2d 804 : 104 S Ct 1482 : 465 US 783 (1984).

96 At 1486.

> drawn from California sources, and the brunt of the harm, in terms both of respondent's emotional distress and the injury to her professional reputation, was suffered in California. In sum, California is the focal point both of the story and of the harm suffered."[97]

Interestingly in *Calder* v. *Jones* the US Supreme Court held that 1st Amendment considerations should not influence the jurisdictional analysis but that questions of free speech should only be dealt with in the substantive law analysis.[98]

This analysis was applied in an early internet case, concerning cybersquatting, *Panavision International LP* v. *Toeppen*.[99] *Mr Toeppen* registered multiple trademark protected brands of well-known businesses such as *Panavision* as generic top-level domain names, then allocated on a first-come, first-serve basis, with the intention of selling them to the trademark owner. The Court found that *Mr Toeppen's* acts were aimed at Panavision with its principal place of business in California and caused it to suffer injury there (trademark dilution)[100] the defendant did not merely register a domain name (while never leaving Illinois) he actively pursued a strategy to sell the domain name to the Californian company and this was sufficient for the Californian courts having jurisdiction.[101]

US courts have therefore moved to an intentional targeting test, which, however leaves open the question whether it is sufficient that the defendant foresees where the plaintiff will suffer the brunt of the harm (so in a defamation case this would be, for most people, the place where they have the focus of their life, *i.e.* where they have a reputation) or whether the defendant needs to actively target the *specific* forum state as such,[102] not just the defendant. This distinction becomes apparent in two internet defamation cases where jurisdiction was at issue.

In the first, *Young* v. *New Haven Advocate*[103] two Connecticut regional newspapers (some of whose articles were published online on their respective websites) had reported on a controversial and much-debated prisoner transfer programme which led to mostly black prisoners being sent south to Virginia and *Mr Young* was a prison warden in a Virginia prison and he claimed that he had been defamed in these newspaper articles as a racist.

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97 At 1486.
98 At 1487.
99 141 F 3d 1316 (9th Cir 1998).
100 At 1321.
101 At 1322.
102 See also *Shrader* v. *Biddinger*, 633 F 3d 1235, 1240 (10th Cir 2011).
103 315 F 3d 256 (4th Cir 2002).

Based on *Calder* v. *Jones*, one would have expected the courts in Virginia to have jurisdiction as *Mr Young* lived and worked in Virginia, this was where he would have felt the brunt of the harm to his reputation and the plaintiffs were aware of both these factors. However, the US Court of Appeals for the 4th Circuit established a new "audience targeting" test. It declined jurisdiction on the basis that the articles were published in two regional newspapers targeted only at local readers in Connecticut and were therefore not aimed at an audience in Virginia and hence, not at the forum. The Court held that in internet defamation cases it was necessary to "manifest an intent to aim the websites or the posted articles at" the forum's "audience"[104], even though the reporters had made some phone calls and interviewed people on the phone in Virginia, one of the newspapers had two handful of subscribers in Virginia, and even though the story was centred around prisons in that state. The Court, on the facts, however, decided that the articles focused *more* on Connecticut than Virginia as it discussed the implementation of the policy there and its negative effect on the prisoners and their families.[105]

Arguably this argument is deeply flawed, as readers in Virginia, in a state likewise affected by the prison policy, would also have been interested in this debate and even though the articles were published in regional newspapers,[106] they would have found these articles through search engines and through republication on other internet sources.

The second case, *Burdick* v. *Superior Court*[107] concerns a claim for defamation made on the defendant's Facebook wall. The Californian plaintiffs are medical scientists who ran a blog "Barefacedtruth.com" in which they exposed a skincare product as unsafe and defective. The representatives of the skin care company reacted with a campaign of harassment including allegedly defamatory statements on Facebook that associated the plaintiffs with fraud and domestic violence. The Californian courts declined to assert jurisdiction and found that the plaintiffs had failed to show that the Facebook post had been aimed or targeted at California, in particular, there was no evidence that the Facebook posts had been accessed in California.

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[104] 315 F 3d 256, 258-9 (4th Cir 2002).

[105] 315 F 3d 256, 263-4 (4th Cir 2002).

[106] From the case report, though it is not entirely clear whether there was evidence that the two articles complained of were in fact published online. Circuit Judge Michael states in his opinion that the plaintiff "alleged" that they were so published, but the evidence he adduces relate to printouts from the websites which do not contain the offending articles at 258.

[107] 233 Cal. App. 4th 8 (2015); (2016) 43 Western State Law Review 291-295.

The Californian Court, in particular, referred to the US Supreme Court decision in *Walden* v. *Fiore*.[108] *The context of Walden* v. *Fiore* is not internet related, the case concerns the seizure of cash from the plaintiffs in Puerto Rico and later action by a Georgia-domiciled US drug enforcement official at Atlanta airport suspecting the money to be the proceeds of crime. The plaintiffs then travelled to their destination in Las Vegas, Nevada, the money was eventually returned and they brought proceedings against the immigration official from Nevada. The US Supreme Court held that it was not sufficient for jurisdiction over a defendant that the defendant could foresee where the injury would fall (here the immigration official knew that the plaintiff were Nevada residents when conducting the search, and seizure of the money). The US Supreme Court held that the *tort itself* must be *aimed* at the forum *state* and declined jurisdiction.[109] Therefore the minimum contact analysis must focus on the defendant's contacts with the forum state itself, not the defendant's contacts with persons who reside in the forum state.[110]However, in *Walden,* the US Supreme Court distinguishes the case before it from defamation cases in that defamation requires publication of the libel to third parties and hence it is the publication in the forum state which may provide the link between the defendant and the forum state.[111] By contrast, none of the defendant's conduct at the airport in Atlanta linked him with Nevada: "the effects of [defendant's] conduct on [plaintiffs] are not connected to the forum State in a way that makes those effects a proper basis for jurisdiction".[112]

These three cases show a trend to find that the defendant being able to foresee that the plaintiff would suffer the direct or indirect, effects of the harm in their state of residence is not sufficient to fulfil the purposeful availment test under the minimum contacts doctrine. In addition, the plaintiff must have actively aimed the tort into the forum state (for example by targeting a communication or publication there) such that it can be said that jurisdiction is based on the defendant's conduct (and not merely linking him to a plaintiff resident in the forum).[113] However, it should also be noted that *Walden* has not overruled *Calder* v. *Jones*, but distinguished it for publication/communication torts. Furthermore, the narrowing of the doctrine in *Calder* v. *Jones* in *Burdick* (in a state court) does not as such change federal

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[108] *Walden* v. *Fiore*, 2014 SCC OnLine US SC 55 : 62 L Ed 2d 516 : 134 S Ct 1115 : 571 US ___ (2013).
[109] At 1123-4.
[110] At 1122-3.
[111] At 1124.
[112] At 1125.
[113] W. Schildknecht, "Justice for J-Law? Specific Personal Jurisdiction Over Internet Torts in the Wake of *Walden* v. *Fiore*" (2016) 56 Santa Clara Law Review 1-32, 10-11.

law- thus it can be said that *Calder* v. *Jones* is good law and is applied to internet communication torts.

VI. Indian Case law

Developments parallel to the US can be observed in India. In one of the earliest cases, a dispute about cybersquatting in respect of which the claimant brought a passing off claim, (*Casio India Co. Ltd.* v. *Ashita Tele Systems (P) Ltd.*)[114] the Court found that it had jurisdiction based on the accessibility of the website to which the disputed domain name resolved. The defendant was a Mumbai-based business, but the claimant brought the claim in Delhi. The Court quoted the judgment in the *Gutnick case*, where the Australian High Court had found that the tort of defamation was committed at the place where the publication was accessed and read: "once access to the impugned domain name website could be had from anywhere else, the jurisdiction in such matters cannot be confined to the territorial limits of the residence of the defendant".[115] Very early cases in the US also based internet jurisdiction on accessibility.[116]

However subsequent case law in India moved away from a test purely based on accessibility and, like in the US, developed a balanced targeting test based on interactivity, purposeful availment and reasonableness. Effectively the courts in India amalgamated the US jurisdictional tests (interactivity, effects test and reasonableness) into the Indian rules on jurisdiction and in particular the determination of where the cause of action had arisen or whether the defendant carried on business in the place of the forum.

Mr Justice S. Muralidhar wrote in his 2010 law review article: [the defendant's actions] "must have resulted in some harm or injury to the plaintiff within the territory of the forum state. Since some effect of a website is bound to be felt in several jurisdictions given the nature of the internet, courts have adopted a 'tighter' version of the 'effects' test, which is 'intentional targeting'."[117]

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[114] 2003 SCC OnLine Del 833.

[115] *Dow Jones* v. *Gutnick*, 2002 HCA 56, 58.

[116] See for example *Inset Systems Inc.* v. *Instruction Set Inc.*, 937 F Supp 161 (D. Conn. 1996) and *Maritz Inc.* v. *Cybergold Inc.*, 947 F Supp 1328 (ED Mo 1996) — see the discussion in Michael A. Geist "Is There a There There? Towards Greater Certainty for Internet Jurisdiction" (2001) 16 Berkeley Technology Law Journal 1345, 1361.

[117] Justice S. Muralidhar, "Jurisdictional Issues in Cyberspace" (2010) 6 The Indian Journal of Law and Technology 1-42, 15.

For example in the *India TV case*,[118] Mr Justice Sanjay Kishan Kaul pointed out, as a starting point, that ordinarily jurisdiction is exercised in the place where the defendants reside, carry on business or personally work for gain.[119] The claimant had a registered trademark in "India TV" and operated a popular news channel in Hindi from Delhi and the defendants, various US-based entities, had registered and used the domain name "indiatvlive.com". The Court referred to the three-part test used by US courts established in *Cybersell Inc.* v. *Cybersell Inc.*,[120] namely that "(1) The non-resident defendant must do some act or consummate some transaction with the forum or perform some act by which he purposefully avails himself of the privilege of conducting activities in the forum, thereby invoking the benefits and protections; (2) the claim must be one which arises out of or results from the defendants forum-related activities; and (3) exercise of jurisdiction must be reasonable".[121] Furthermore, Mr Justice Sanjay Kishan Kaul also referred to the finding of the *Zippo case*[122] that the likelihood that personal jurisdiction can be exercised over an out-of-state entity is proportionate to the degree of interactivity of the website.[123] He held that accessibility of a website in the forum state as such as insufficient to grant jurisdiction.[124] The Court held that India TV was targeted at India as it was a subscription channel, and its intention to purposefully avail itself of business in India was clear from several press releases it had issued.[125]

The issue of personal jurisdiction reached a larger bench in the landmark case of *Banyan Tree Holding (P) Ltd.* v. *A. Murali Krishna Reddy*[126] with the judgment given by Mr Justice S Muralidhar. This case concerned an action for passing off and a peculiar feature was that neither the claimant, (who was a Singaporean company) nor the defendant (who was an entity established in Hyderabad) was domiciled in the place of the forum (Delhi). The Court had to examine whether the cause of action arose in Delhi based on the website used by the defendant which used the claimant's name (Banyan Tree) well-established in connection with spa hotels.

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[118] *India TV, Independent News Service (P) Ltd.* v. *India Broadcast Live, LLC*, 2007 SCC OnLine Del 960 : (2007) 35 PTC 177 : (2007) 2 MIPR 396.
[119] Para 1.
[120] See Fn 58.
[121] Paras 30, 45.
[122] Fn 66.
[123] Para 32.
[124] Paras 46, 48.
[125] Paras 49-50.
[126] 2009 SCC OnLine Del 3780.

In this case, the Court expressly overruled the earlier *Casio India* Decision[127] and held that in order to determine personal jurisdiction a combination of the *Calder* v. *Jones* effects test and the *Zippo* interactivity test should be used.[128] The Court stated that "since over the years, most websites are interactive to some degree, there has been a shift from examining whether the website is per se passive or active to examining the nature of the activity performed using the interactive website. The difficulty experienced with the application of the Zippo sliding scale test has paved way for the application of the 'effects' test."[129] The Court explained that this meant that some effects of the website must be felt in the forum state, but that this in itself was not sufficient. In addition, there must be intentional targeting, as laid down in *Calder* v. *Jones,* where the defendant could have reasonably anticipated that the brunt of the harm would be felt in the forum state and where it could be said that the tort was aimed at the forum state.[130] The Court also referred to the *Step Two* US Court of Appeals Decision[131] in which a targeting test had been established which required a showing that the defendants "'purposefully availed' itself of conducting activity in the forum state, by directly targeting its website to the state, knowingly interacting with residents of the forum state via its website".[132] The Court adopted a purposeful availment test which required that "it would have to be shown that the nature of the activity indulged in by the Defendant by the use of the website was with an intention to conclude a commercial transaction with the website user."[133] Finally, it held that a lone "trap" transaction which the defendant entered was not sufficient to show such purposeful availment.[134]

Super Cassettes Industries Ltd. v. *Myspace Inc.* by contrast is a case where the Court distinguished *Banyan* on its facts by pointing out that the social networking site *myspace,* which allowed users to upload and download copyright infringing content was sufficiently interactive and specifically targeted at Indian users through geo-location tools, for the cause of action under Section 20 of the Civil Procedure Code to arise in India.[135]

In *Federal Express Corpn.* v. *Fedex Securities Ltd.*[136] the claimant was the US courier service based in Memphis, USA, operating multiple services

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[127] Para 38.
[128] Para 42.
[129] Paras 21-22.
[130] Paras 22-23.
[131] Fn 81.
[132] Para 26.
[133] Para 40.
[134] Para 57.
[135] 2011 SCC OnLine Del 3131: (2011) 47 PTC 49, paras 56-57.
[136] 2017 SCC OnLine Del 7906.

under the registered trademark "FEDEX". The defendants were a number of B2B financial services providers established in Mumbai and using the FedEx name, against which use the claimant sought to obtain an injunction. On the question of whether the cause of action arose in Delhi, the Court relied on *Banyan* but found in the present case on the facts, as the defendant's website was not specifically targeted at Delhi, but advertised the defendant's services throughout India. In particular, there were no commercial transactions entered into by users in the place of the forum through the websites and thus, the court found that it did not have jurisdiction.[137]Finally a similar case concerning passing off, where the Delhi Court has denied jurisdiction was *Indovax (P) Ltd.* v. *Merck Animal Health.* Again, the Court found that no commercial transactions were targeted at the forum through the use of the website.[138] Similar to the US courts, in these last two cases, the Indian courts require active targeting of the *specific* place of the forum (*e.g.* Delhi as opposed to India as a whole).

Indian courts have mentioned the reasonableness test as part of their analysis, but of course the analysis under Indian law is not primarily based on a constitutional principle of due process as in the US, but on the questions raised by Section 20 of the Code of Civil Procedure, whether the defendant carries on business in the forum state or the cause of action arises there, wholly or partly. For example, in *India TV, Independent News Service (P) Ltd.* v. *India Broadcast Live, LLC* the Court stated that "whether the exercise of jurisdiction is reasonable" is part of the jurisdictional analysis[139], but it is not entirely clear how the reasonableness standard is implemented within the Indian rules on jurisdiction.

Finally, concerning *forum non conveniens*, the common law in India recognises the principle of *forum non-conveniens*[140], *which consists of a two-step test; first, examining whether there is an alternative forum with jurisdiction which is appropriate in the circumstances and secondly, whether it is in the interest of justice that this alternative forum should deal with the case.*[141] *However, forum non-conveniens* is only applicable

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[137] Paras 23-24.

[138] 2017 SCC OnLine Del 9393, paras 18-19.

[139] 2007 SCC OnLine Del 960 : (2007) 35 PTC 177 : (2007) 2 MIPR 396, para 47.

[140] *India TV, Independent News Service (P) Ltd.* v. *India Broadcast Live, LLC*, 2007 SCC OnLine Del 960 : (2007) 35 PTC 177 : (2007) 2 MIPR 396.

[141] *Horlicks Ltd.* v. *Heinz India (P) Ltd.*, 2009 SCC OnLine Del 3342, referring to the English House of Lords case of *Spiliada*, para 28: "The basic principle is that a stay will only be granted on the ground of forum non conveniens where the court is satisfied that there is some other available forum, having competent jurisdiction, which is the appropriate forum for the trial of the action i.e. in which the case may be tried more suitably for the interests of all the parties and the ends of justice", and also *India TV, Independent News Service*

as against a foreign forum, not between Indian courts and the same applies to anti-suit injunctions.[142] Furthermore *forum non-conveniens*, unlike the reasonableness test, is not part of the jurisdictional analysis, but is argued after the court has found that it is competent to hear the case.[143] Thus the jurisdictional analysis and the *forum non-conveniens* analysis are two distinct steps in the courts' reasoning.

VII. Conclusion

The US jurisdictional tests are very flexible and malleable based on general principles which can be interpreted to suit new factual scenarios. This adaptability accommodates new business models and new communication technologies.

The internet has created a further dimension to the complexity of jurisdiction- in many cases internet communications or interactions are directed nowhere and everywhere at the same time. This is encapsulated in the paraphrase[144] of Gertrude Stein's phrase that there is "no there, there" on the internet- the jurisdictional analysis frequently does not result in an obvious "there". The challenges of internet jurisdiction will require careful balancing between the parties to ensure the interests of justice are served and a careful balancing between local and international interests.[145]

Operators on the internet may in certain instances not target a particular US state for business but at the same time target the whole of the US in an effort to maximize their reach and/or the numbers of sales. A similar phenomenon we have seen, of course in India as well, where plaintiffs have sued in a particular forum with the argument that website marketing was directed at the whole of India, including Delhi (*Federal Express Corpn.* v. *Fedex Securities Ltd.* and *Indovax (P) Ltd.* v. *Merck Animal Health*).

(P) Ltd. v. *India Broadcast Live, LLC*, 2007 SCC OnLine Del 960 : (2007) 35 PTC 177 : (2007) 2 MIPR 396, para 53.

[142] *Ibid.*, para 84.

[143] Curtailing the excesses of common law jurisdiction, *India TV, Independent News Service (P) Ltd.* v. *India Broadcast Live, LLC*, 2007 SCC OnLine Del 960 : (2007) 35 PTC 177 : (2007) 2 MIPR 396, para 25.

[144] *Digital Equipment Corpn.* v. *Altavista Technology Inc.*, 960 F Supp 456, 462 (D Mass 1997) quoted in MA Geist's seminal article "Is There a There? Towards Greater Certainty for Internet Jurisdiction" (2001) 16 Berkeley Technology Law Journal 1345-1406, 1346: "the 'there' is everywhere there is internet access. The quote stems from G Stein's *Everybody's Autobiography* (Exact Change 1993) 298.

[145] Justice S. Muralidhar, "Jurisdictional Issues in Cyberspace" (2010) 6 The Indian Journal of Law and Technology 1-42, 30.

In some instances, this has led courts to assert jurisdiction widely and broadly, finding minimum contacts merely based on remote, internet-mediated contacts (*Patterson, Zippo*, *Panavision*). While interactivity is continued to be included as a criterion, courts both in the US and India have switched to the so-called effects test which examines whether the defendant's conduct was targeted at the forum state (*Banyan Tree*).

In the US, for communication torts, the courts have latched on the fact that the defendant's conduct was not actively directed at an audience in a specific forum, hence denying jurisdiction for this reason (*Young*, *Burdick*). This latest trend examined is a higher test- for minimum contacts, where plaintiffs must show that they targeted a particular state (not just knowing that the defendant is located in a particular state). This trend is also observable in the Indian common law jurisprudence, in passing off, trademark and copyright cases as discussed above.

However, this narrower targeting test encourages distribution and communication models which maximize access to a large audience or market, while at the same time avoiding direct contacts with a specific forum, and thus exposure to legal liability, thus disconnecting market entry opportunities from litigation risk, which seems an immoral disconnect- greater opportunities should be commensurate with greater liability risk. As the Court in *Dedvukaj* v. *Maloney* pointed out: "Internet forums such as eBay expand the seller's market literally to the world and sellers know that and avail themselves of the benefits of this greatly expanded marketplace. It should, in the context of these commercial relationships, be no great surprise to sellers—and certainly no unfair burden to them—if, when a commercial transaction formed over and through the internet does not meet a buyer's expectations, they might be called upon to respond in a legal forum in the buyer's home state. Sellers cannot expect to avail themselves of the benefits of the internet-created world market that they purposefully exploit and profit from without accepting the concomitant legal responsibilities that such an expanded market may bring with it."[146]

The targeting test which seems to be the standard test for assessing jurisdiction in internet cases has originated in the minimum contacts analysis to ensure due process for out-of-state defendants. It is based on the idea that it is the defendant's purposeful availment of conducting business in the forum state or directing tortious activities at residents in the forum state which subjects him to the power of the courts there. Thus, if a defendant targets an area wider and more inclusive than the place of the forum, courts should

[146] *Dedvukaj* v. *Maloney*, 447 F Supp 2d 813, 820 (ED Mich 2006).

consider assuming jurisdiction if this wider area includes the place of the forum.

In this connection, it should also be pointed out that the targeting test is counterbalanced by the reasonableness test (2nd leg of the *Shoe* analysis) and subject to the notion of *forum-non conveniens* examined above. This test has the potential "to protect small-scale and part-time sellers from an over-inclusive doctrine of personal jurisdiction"[147] or in turn protect the interests of consumers or employees as claimants (or defendants) by balancing the ability of the parties to cross a jurisdictional border and defending the state's interest to ensure public policy interests such as product safety or consumer protection legislation. However, as we have seen the "reasonableness test" is rarely used or only to further justify the outcome of the minimum contact analysis. Again, a similar trend can be observed in the case law of the Indian court, where the reasonableness test has been referred to (*India TV)* as a principle which is part of the balancing act, but little flesh has been put on its bones to date. Arguably, more active use of the multi-factor reasonableness analysis would yield better-balanced results. In Indian cases the reasonableness test could be used to balance the interests of both parties and the interests of the states in a way which goes beyond the analysis of the defendant's contacts with the forum, which would create a presumption of jurisdiction which can be displaced by balancing the interests of the parties and states involved.

Comparing the case law in India and the US, it is noteworthy that the courts in India have been influenced by the US minimum contacts doctrine, but it is equally clear that some of the considerations for developing targeting tests are raised by the technology *itself* and therefore, courts all over the world are confronted with the same challenges, which may eventually lead to a novel form of international common law for assessing jurisdiction in the interests of justice. Thus, the courts in both jurisdictions examined have created a balance to ensure, on the one hand, that defendants who could not foresee that they would have to account for their actions in a foreign court are not dragged before a foreign court and, on the other hand, that defendants who infringe a claimant's rights and legal interests remotely from a foreign location cannot do so without impunity, thus ensuring access to justice. This is a difficult balance to make and no doubt one which has to be further fine-tuned as technology evolves.

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[147] R.M .Pollack, " 'Not of Any Particular State': *J. McIntyre Machinery Ltd*. v. *Nicastro and Non-specific Purposeful Availment*" (June 2014) 89 New York University Law Review 1088-1116, 1115.

The Right-To-Education Responsibilities of Book Publishing Companies

*Emmanuel Kolawole Oke**

Abstract *The responsibilities of copyright owners, specifically book publishers, should be construed from a human rights perspective. Building on the work of John Ruggie and his 'Guiding Principles on Business and Human Rights,' this paper contends that book publishers have a responsibility to respect human rights including the right to education. As it relates to copyright law, respecting the right to education entails respecting the measures that countries have incorporated into their national copyright laws to facilitate access to learning materials. Furthermore, corporate actors that own copyright in learning materials should not use litigation or the threat of litigation to try to prevent teachers and students from relying on limitations and exceptions to copyright to gain access to learning materials.*

I. Introduction

What should be the role of copyright law with regard to education and access to learning materials? Should those who own copyright have any responsibility concerning facilitating access to learning materials such as textbooks? What role, if any, can human rights play in negotiating the interface between copyright and access to learning materials? These questions and many more have come to the forefront in the light of recent legal challenges brought by book publishing companies against educational institutions involving the unauthorised use by the latter of copyright protected works belonging to the

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former in the course of teaching and instruction.[1] This paper does not seek to question the role of copyright in incentivising the creation of new and useful works or its role in rewarding creators. It however agrees with the view that, because of the powerful nature of the monopoly conferred by copyright,[2] owners of copyright (including book publishers) should bear certain responsibilities.[3] In this regard, it is crucial to draw a distinction between authors who produce creative works and who may not necessarily always own the copyright in their works on the one hand and copyright owners

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[1] Copyright owners, including book publishers, have sued educational institutions for copyright infringement in a number of countries with varying degrees of success. For cases in the United States, see for instance, *Basic Books Inc.* v. *Kinko's Graphics Corpn.*, 758 F Supp 1522 (SDNY 1991); *Princeton University Press* v. *Michigan Document Services Inc.*, 99 F 3d 1381 (6th Cir 1996); *Cambridge University Press* v. *Patton*, 755 F 3d 87 (11th Cir 2014); *Cambridge University Press* v. *Mark P. Becker*, 1:08-CV-1425, (ND Ga 2016). For cases in Canada, see for instance, *Law Society of Upper Canada* v. *CCH Canadian Ltd.*, 2004 SCC OnLine Can SC 13 : 2004 SCC 13; *Province of Alberta* v. *Canadian Copyright Licensing Agency*, 2012 SCC OnLine Can SC 37 : 2012 SCC 37; *Canadian Copyright Licensing Agency* v. *British Columbia Ministry of Education*, 2017 FCA 16; *Canadian Copyright Licensing Agency* v. *York University*, 2017 FC 669. For cases in India, see, *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386; affirmed in part and remanded with instructions on appeal *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 6229 : (2017) 69 PTC 123. For some scholarly commentary on this trend, *see*, Ann Bartow, "Educational Fair Use in Copyright: Reclaiming the Right to Photocopy Freely", (1998) 60 U. Pitt. L. Rev. 149, 151 (noting that, "Publishers … have used favorable court decisions and the threat of expensive litigation to coerce commercial photocopiers to pay permission fees for the privilege of making any copies at all, whether or not the use might be a fair one, and in some cases even when the work is not eligible for copyright protection."). *See also*, Carol Silberberg, "Preserving Educational Fair Use in the Twenty-First Century", (2001) 74 S. Cal. L. Rev. 617; Brandon Butler, "Transformative Teaching and Educational Fair Use after Georgia State", (2015) 48:2 Connecticut Law Review 473.

[2] *See*, Laurence Helfer and Graeme Austin, *Human Rights and Intellectual Property: Mapping the Global Interface*, (Cambridge University Press, 2011), p. 358 (noting that, "copyright law gives powerful legal rights to authors and publishers. These legal rights impose individual duties on the rest of us. We are obliged not to perform the acts that are within the exclusive rights of the copyright owner, including the duties not to reproduce, distribute, or translate copyright-protected works."). *See also*, Lea Shaver, "Copyright and Inequality", (2014) 92 Washington University Law Review 117, 123 (noting that, "Copyright protection is making cultural works substantially more expensive, impeding translations into other languages, and inhibiting the emergence of open business models that might reach more people in more places. The very doctrines and policies justified as enhancing the incentives for cultural production are unwittingly reinforcing social disadvantage and exclusion from cultural participation."). *See further*, Jeremy Waldron, "From Authors to Copiers: Individual Rights and Social Values in Intellectual Property", (1993) 68:2 Chicago-Kent Law Review 841.

[3] *See*, Jacqueline Lipton, "Information Property: Rights and Responsibilities", (2004) 56 Florida Law Review 135; Haochen Sun, "Copyright and Responsibility", (2013) 4 Harvard Journal of Sports & Entertainment Law 263.

(like book publishers) who typically wield the monopoly rights conferred by copyright law on the other hand.[4]

It will be argued in this paper that the responsibilities of copyright owners, specifically book publishers, should be construed from a human rights perspective. Importantly, building on the work of John Ruggie and his 'Guiding Principles on Business and Human Rights',[5] this paper contends that book publishers have a responsibility to respect human rights including the right to education. As it relates to copyright, respecting the right to education entails respecting the measures that countries have incorporated into their national copyright laws to facilitate access to learning materials.

In analysing book publishers' responsibilities with regard to the right to education, this paper will be divided into three main parts. The first part will discuss why those who own copyright should bear certain responsibilities. The second part of the paper will thereafter introduce a human rights dimension to the analysis of the responsibilities of copyright owners. It will first critically examine the interface between copyright and the right to education. Thereafter, it will examine the responsibilities of copyright owners (specifically focusing on book publishers) in the light of the UN Guiding Principles on Business and Human Rights. In the light of the analysis in the first and second parts of the paper, the third part of the paper will examine the copyright dispute between Oxford University Press, Cambridge University Press, and Taylor and Francis on the one hand and the University of Delhi on the other hand (hereinafter, the "Delhi University Photocopy case").[6] The dispute involved the production and sale of course-packs incor-

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[4] As Lawrence Liang notes, "The idea that copyright is a system of balances runs the risk of being a cliché. If the idea of balance has thus far been framed primarily in terms of the provision of incentives to authors versus ensuring that the public has access to works, it might be time to acknowledge that the fault lines lie less in pitting the interest of authors against a robust public sphere and more in the structural arrangements of knowledge production, where private monopolies threaten both authors and the public sphere." Lawrence Liang, "Paternal and Defiant Access: Copyright and the Politics of Access to Knowledge in the Delhi University Photocopy Case", (2017) 1:1 Indian Law Review 36, 55.

[5] *See*, Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, John Ruggie, *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework*, UN Human Rights Council, A/HRC/17/31, (21 March, 2011) (noting that the "responsibility to respect human rights is a global standard of expected conduct for all business enterprises wherever they operate."). The UN Human Rights Council endorsed the Guiding Principles on Business and Human Rights in June 2011. *See also*, John Ruggie, *Just Business: Multinational Corporations and Human Rights* (W.W. Norton & Co., 2013).

[6] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386; affirmed in part and remanded with instructions on appeal in *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 6229 : (2017) 69 PTC 123.

porating photocopies of extracts of copyright protected works belonging to the above-named book publishing companies. This paper will contend that some of the arguments canvassed before the courts by the book publishers in this case indicate an attitude of disrespect towards the right to education. However, the subsequent decision of the book publishers to withdraw the suit reflects some level of respect for the right to education,[7] albeit a belated one.

The paper will conclude with the view that, as states bear the primary responsibility with regard to the right to education, states should ensure that they incorporate a right-to-education perspective into the design, interpretation, and enforcement of their national copyright laws. However, corporate actors also have a responsibility to respect human rights including the right to education. Thus, companies that own copyright in learning materials (such as book publishers) equally have a responsibility to respect measures that states have introduced into their national copyright laws to facilitate access to learning materials.

II. Copyright and Responsibility

In a seminal piece on information property, Jacqueline Lipton suggests a framework for balancing the competing interests between owners of information property and other members of the society.[8] According to Lipton, legal duties ought to be imposed on those who own information property as part of their property ownership in order to provide some protection for other competing interests in information.[9] In her framework, Lipton draws on the law and theory relating to real property as an analogy for intellectual property (although she clarifies that she is not suggesting that ownership of information should be equated with ownership of real property).[10]

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[7] *See*, Joint Statement by Oxford University Press, Cambridge University Press and Taylor & Francis, (9 March, 2017). Available at <http://fdslive.oup.com/asiaed/News%20Items%20and%20Images/Joint%20Public%20Statement.pdf>

[8] Jacqueline Lipton, "Information Property: Rights and Responsibilities", (2004) 56 Florida Law Review 135. In her article, Lipton defines "information property" to include "copyrights, patents, trade secret rights, contractual licences revolving around the licensing of proprietary information, and *sui generis* database rights." *Ibid*., 140, note 24. *See also*, Jacqueline Lipton, "Protecting Valuable Commercial Information in the Digital Age: Law, Policy, and Practice", (2001) 6 J. Tech. L. & Policy 1, 3-4. Thus, in the context of Lipton's work, "information property" can be taken as being coterminous with what we commonly refer to as "intellectual property".

[9] *Ibid*., 140.

[10] *Ibid*., 142.

Lipton notes that rights over real property have never been absolute and have always entailed legal duties owed by the owners to other members of society.[11] Building on this, Lipton queries whether we ought to learn something from real property in terms of the legal duties that can be imposed on those who own rights in information property.[12] While acknowledging that some duties are already imposed on those who own intellectual property (such as the requirement that an invention be disclosed before an inventor can obtain a patent), Lipton contends that the duties currently imposed on owners of intellectual property rights are not enough to "protect specific individuals with competing interests in relevant intellectual property, particularly those with limited means to assert or enforce their interests."[13] Lipton's main argument is that those who own intellectual property rights should also bear affirmative duties.[14]

Importantly, one of the specific competing interests that Lipton identifies in her paper is the need to have access to copyright protected works, specifically the need to have access to protected information for educational purposes.[15] If there is any group with limited means to assert or enforce their interests in obtaining access to copyright protected works for educational purposes, it is teachers and students in developing countries with poor purchasing power. Drawing on empirical data from South Africa, Shaver notes that "South Africans of all classes and ethnicities value and enjoy reading, and would prefer to read more often – but they are frustrated in realising this desire by the unaffordably high cost of books."[16] In the same vein, writing about India, Liang notes that "[i]t is impossible to understand the challenges facing education in India – and the critical importance of copyright law to it – without putting the costs of learning materials into perspective."[17]

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[11] *Ibid*., 148.

[12] *Ibid*., 149 (noting at 165 that, "Property rights in the past have never been absolute, and there is no reason why information property rights should be any different … We need to start thinking about an overarching policy framework for information property rights that incorporates concurrent legal duties.").

[13] *Ibid*.

[14] *Ibid*., 165 (noting that, "…while fair use defenses and statutory limitations on the scope of property rights are useful ways of preserving competing interests in information and protecting the public domain to some extent, their major disadvantage is that they do not impose any significant affirmative duties on the right holder. The onus of establishing that a particular use should be permitted as a fair use, or of proving that a particular right holder is asserting rights beyond the scope granted by the State, will not fall on the right holder. Instead, it will be up to the party attempting to access or use, or to restrict the property holder's use of, a particular information product to convince a court of these things. Such a party may not have the time, resources, or inclination to take relevant action.").

[15] *Ibid*., 139, note 20.

[16] Shaver, (n 2), 131.

[17] Lawrence Liang, "Exceptions and Limitations in Indian Copyright Law for Education: An Assessment", (2010) 3:2 The Law and Development Review 197, 205.

While Lipton's arguments apply to intellectual property in general, another scholar has equally developed a similar argument that specifically focuses on copyright. In his article on copyright and responsibility, Haochen Sun contends that owners of copyright should not just enjoy exclusive rights but also bear social responsibilities.[18] According to Sun, copyright ought to be reconfigured to embody the trinity of values that comprise the right of the copyright owners, user's rights, and the responsibility of copyright owners.[19]

Grounding his argument in the ethical norm of reciprocity, Sun contends among other things that copyright owners should bear responsibilities "as a means of requiring them to respond to others' contributions to the creation and dissemination of their works."[20] Sun presents a socio-centric view of copyright that acknowledges the role of both authors and other members of the society.[21] While recognising that authors play an important role in the creation and dissemination of their works, Sun equally highlights the contributions of other members of the society in the production of copyright protected works by noting that these "others provide cultural artefacts on which an author draw to create new works" and they equally "act as collaborators in disseminating meanings of an author's works."[22]

If copyright owners should bear responsibilities, how would they be held accountable? In response to this, Sun argues that the limitations to copyright should be reconceptualised as responsibilities such that these limitations (such as fair use) would no longer be considered as affirmative defences to claims of copyright infringement.[23] According to Sun, this implies that, in an action for copyright infringement, the copyright owner would have to prove that there has been an unauthorised use of its work and also that this use is not fair use.[24] Sun further suggests that the copyright misuse doctrine[25]

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[18] Haochen Sun, "Copyright and Responsibility", (2013) 4 Harvard Journal of Sports & Entertainment Law 263.

[19] *Ibid*., 267.

[20] *Ibid*., 282.

[21] *Ibid*., 287 (noting that, "Works are created in a rich interaction between a creator and the cultural and social context in which he or she is situated."). *See also*, Christian Stallberg, "Towards a New Paradigm in Justifying Copyright: An Universalistic-Transcendental Approach", (2008) 18 Fordham Intell. Prop. Media & Ent. L.J. 333. See further, *Emerson* v. *Davies*, 8 F Cas 615, 619 (CCD Mass 1845) (No. 4436) where Justice Story observed that "in literature, in science and in art, there are, and can be, few, if any, things, which, in an abstract sense, are strictly new and original throughout. Every book in literature, science and art, borrows, and must necessarily borrow, and use much which was well known and used before."

[22] *Ibid*., 285.

[23] *Ibid*., 306.

[24] *Ibid*., 307.

[25] See, *Lasercomb America Inc*. v. *Job Reynolds*, 911 F 2d 970, 977 (4th Cir 1990) applying the decision of the United States Supreme Court dealing with misuse of patent in *Morton*

can be used to penalise copyright owners who fail to accommodate uses of works that are allowed pursuant to limitations to copyright such as fair use.[26]

It is easy to see how Sun's proposed framework might work successfully in an action for copyright infringement instituted by a book publishing company against a poor defendant such as an instructor in an educational institution, especially where, for instance, the instructor's action involves the making of photocopies of protected works for educational purposes. However, Sun's framework can become quite problematic where a poor author with limited resources is trying to enforce his or her copyright against a book publishing company or a film production company. In such a case, it would be unfair to expect the author to bear the burden and cost of proving both copyright infringement and the absence of fair use. Thus, a key flaw in Sun's framework is its failure to consider the impact that requiring copyright owners (which might be authors in some cases) to bear this burden might have on poor creators with limited resources.

It is suggested here that a better approach is to retain limitations to copyright as affirmative defences. However, where it is clear from the facts of a case that a copyright owner is obviously trying to use its copyright to prevent a defendant from enjoying the benefits of limitations to copyright such as fair use, a court could employ the copyright misuse doctrine to penalise such a copyright owner. Thus, where a book publishing company is clearly trying to use its copyright to prevent an educational institution from relying on limitations to copyright, the copyright misuse doctrine can be used to hold the book publishing company accountable for its failure to take into account its responsibility to respect the rights of other members of the society when trying to enforce its copyright.[27]

A natural question that one might ask is whether requiring defendants to prove copyright misuse amounts to placing an additional burden on defendants. This concern can be addressed if courts adopt a proposal suggested by

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Salt Co. v. *G.S. Suppiger Co.*, 86 L Ed 363 : 314 US 488 (1942) to develop a misuse of copyright defence and holding that the grant to the author of the special privilege of copyright forbids the use of the copyright to secure an exclusive right not granted by the Copyright Office.

[26] Sun, (n 18), 314-315.

[27] For a similar argument in relation to the use of the copyright misuse doctrine to deter copyright owners from misusing their copyright to censor the speech of others, *see*, David Olson, "First Amendment Based Copyright Misuse", (2010) 52 Wm. & Mary L. Rev. 537, 605-606 (contending that courts should use the copyright misuse doctrine "to deter copyright holders engaged in misuse of their copyrights to chill or control the speech of others.").

David Olson in this regard. Olson suggests that courts may presume copyright misuse where the copyright owner's actions negatively affect uses protected by the First Amendment.[28] According to Olson, "courts could say that there is presumptive First Amendment value to the use of copyrighted works for purposes of scholarship, reporting, or commenting on matters of public concern or on public figures; therefore, copyright misuse may be presumed if a copyright holder is found to have taken actions to negatively affect such uses."[29] Olson's proposal can also be extended to the context of access to educational materials in educational institutions. Thus, where a copyright owner's actions negatively affect the ability of an educational institution to gain access to educational materials, courts may presume copyright misuse.

In practice, this would mean that a defendant seeking to rely on the presumption of copyright misuse would need to present evidence indicating that the copyright owner has engaged in conduct that negatively impacts uses related to freedom of expression or access to educational materials.[30] According to Olson, the copyright owner can rebut the presumption of copyright misuse by presenting evidence to show that "it took the actions it did for other legitimate purposes, and not for the purpose of discouraging scholarship, comment, or critique."[31] Once a court finds that there has been copyright misuse, it does not need to determine whether or not the defendant's use falls within the scope of the exceptions to copyright such as the fair use defence.[32]

This approach will ensure that copyright owners think twice before engaging in conducts that could amount to copyright misuse as a finding of misuse could mean that they would be unable to enforce their copyright until they have cured the misuse.[33] It will also make limitations and exceptions to copyright such as the fair use defence more meaningful to defendants.[34] For instance, educational institutions would be able to rely on such limitations and exceptions to gain access to educational materials without having to be concerned about being threatened with a claim for copyright infringement.

This paper however seeks to go beyond the arguments of both Lipton and Sun with regard to the responsibilities of owners of intellectual property rights. Both authors do not incorporate a human rights perspective into their

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[28] *Ibid*., 601.
[29] *Ibid*.
[30] *Ibid*.
[31] *Ibid*.
[32] *Ibid*.
[33] *Ibid*., 595-596.
[34] *Ibid*., 595.

analysis and frameworks. It is however contended here that the application of a human rights framework to the interface between copyright and education can help to define the relationship between copyright owners and other members of the society. Human rights can equally assist in terms of defining the responsibilities of copyright owners and the establishment of mechanisms to hold them accountable for such responsibilities.[35] As Jochnick points out,

> "The real potential of human rights lies in its ability to change the way people perceive themselves *vis-à-vis* the government and other actors. Rights rhetoric provides a mechanism for reanalysing and renaming 'problems' as 'violations,' and, as such, something that need not and should not be tolerated … Rights make it clear that violations are neither inevitable nor natural, but arise from deliberate decisions and policies. By demanding explanations and accountability, human rights expose the hidden priorities and structures behind violations."[36]

It is thus contended here that, in relation to those who own intellectual property rights, especially corporate actors that own intellectual property rights, human rights provides a stronger normative basis for the imposition of responsibilities. As will be argued in part two below, corporate actors that own intellectual property rights (including copyright), have a duty to respect human rights including the right to education.

III. Copyright in the Context of Business and Human Rights

A. Copyright and the Right to Education

Before analysing the human rights responsibilities of corporate actors that own copyright, it is essential to examine the relationship between copyright and the right to education. The right to education is recognised in Article 26 of the Universal Declaration of Human Rights[37] and Articles 13 and 14 of

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[35] Writing in the context of health, Alicia Ely Yamin notes that, "what a rights-based approach to health uniquely adds … lies precisely in the definition of relationships between rights-holders and duty-bearers, which permits the creation of a framework for and mechanisms of accountability, including effective recourse in the event of violations." *See*, Alicia Ely Yamin, "Will We Take Suffering Seriously? Reflections on What Applying a Human Rights Framework to Health Means and Why We Should Care", (2008) 10:1 Health and Human Rights 45, 49.

[36] Chris Jochnick, "Confronting the Impunity of Non-State Actors: New Field for the Promotion of Human Rights", (1999) 21 Human Rights Quarterly 56, 60.

[37] Art. 26(1) of the Universal Declaration of Human Rights provides that, "Everyone has the right to education. Education shall be free, at least in the elementary and fundamental

the International Covenant on Economic, Social and Cultural Rights.[38] In its General Comment No. 13 on the right to education, the UN Committee on Economic, Social and Cultural Rights (UN CESCR) provides some elaboration on the content and scope of the right to education.[39] The UN CESCR identified four essential components of the right to education: availability, accessibility, acceptability, and adaptability.[40] The focus here will be on availability and accessibility.

Concerning availability, the UN CESCR stated that this requires that "[f]unctioning educational institutions and programmes have to be available in sufficient quantity."[41] It further noted that what these institutions and programmes will require to function will be dependent on several factors although it stressed that they are all likely to require, among other things, teaching materials and that some will equally need facilities such as a library, computer facilities and information technology.[42] It could thus be argued that learning materials (such as textbooks) will also be required for educational institutions and programmes to function.

In relation to accessibility, the UN CESCR stated that educational institutions and programmes should be accessible to every person.[43] Accessibility here includes economic accessibility, and according to the UN CESCR, this requires that "education has to be affordable to all."[44] If access to learning and teaching materials is a requirement for functioning educational institutions and programmes, it can be implied that learning materials such as textbooks should also be affordable. Thus, from a human rights perspective, both students and teachers have a right to obtain access to learning and teaching materials at affordable prices. In order for the right to education to have any meaning, teaching and learning materials should not just be available, they should be accessible and affordable.

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stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit."

38 Art. 13(1) of the International Covenant on Economic, Social and Cultural Rights provides that, "The States Parties to the present Covenant recognize the right of everyone to education. They agree that education shall be directed to the full development of the human personality and the sense of its dignity, and shall strengthen the respect for human rights and fundamental freedoms…."

39 UN Committee on Economic, Social and Cultural Rights, General Comment No. 13: The Right to Education (Art. 13), E/C.12/1999/10, (8 December, 1999).

40 *Ibid*., para 6.

41 *Ibid*.

42 *Ibid*.

43 *Ibid*.

44 *Ibid*.

As noted in the introduction, copyright confers powerful monopoly rights on those who own copyright in protected works. Copyright law, if not carefully designed and implemented, can potentially impede access to teaching and learning materials such as textbooks. National copyright laws should therefore be designed and implemented in a manner that incorporates a right-to-education perspective. Incorporating a right-to-education perspective implies that states do not ignore their human rights obligations when designing and implementing copyright laws. It means taking into account the need to enhance access to teaching and learning materials at affordable prices when designing and implementing copyright laws.

In this regard, it is worth highlighting, as the UN CESCR also notes, that states bear the primary responsibility with regard to respecting, protecting, and fulfilling the right to education.[45] According to the UN CESCR, the obligation to respect the right to education requires states to "avoid measures that hinder or prevent the enjoyment of the right to education."[46] In relation to copyright law, a right-to-education perspective thus requires that countries should not introduce measures into their national copyright laws that will make it more difficult for teachers and students to gain access to teaching and learning materials. Importantly, any measure that will narrow down the scope of permissible unauthorised uses of copyright protected works for educational purposes should be avoided by states.

The obligation to protect the right to education, according to the UN CESCR, requires states to "take measures that prevent third parties from interfering with the enjoyment of the right to education."[47] In relation to copyright law, this implies that states are required to ensure that owners of copyright such as book publishing companies do not exercise or enforce their copyright in a manner that interferes with the right of students and teachers to gain access to teaching and learning materials at affordable prices. Importantly, courts, as organs of the state, could use doctrines such as the copyright misuse doctrine (discussed in part two above) as a means of penalising corporate actors that institute copyright infringement suits with the main objective of preventing students and teachers from making permitted unauthorised uses of copyright protected works for educational purposes.

According to the UN CESCR, the obligation to fulfil the right to education requires, among other things, that states should "take positive measures that enable and assist individuals and communities to enjoy the right to

[45] *Ibid*., para 46.
[46] *Ibid*., para 47.
[47] *Ibid*.

education."[48] As it relates to copyright law, this implies that a state may need to re-examine its copyright law and policy with a view to assessing its impact on access to affordable learning and teaching materials in its country. In this regard, it may become necessary for a state to revise its national copyright law in order to introduce limitations and exceptions to copyright that are aimed at facilitating access to affordable learning and teaching materials.

States thus have a duty to incorporate a right-to-education perspective into the design, amendment, interpretation, and enforcement of their national copyright laws. Importantly, copyright laws should not be designed or enforced in a manner that impedes access to affordable learning and teaching materials. Limitations and exceptions to copyright can play a crucial role in ensuring that copyright does not impede access to teaching and learning materials. Farida Shaheed, the former UN Special Rapporteur in the field of cultural rights, confirms this in her report on copyright policy and the right to science and culture where she notes that limitations and exceptions can "expand educational opportunities by promoting broader access to learning materials."[49] Shaheed further adds that states "have a positive obligation to provide for a robust and flexible system of copyright exceptions and limitations to honour their human rights obligations."[50]

There are a number of exceptions and limitations to copyright that states can implement at the national level to facilitate access to teaching and learning materials. Firstly, states could adopt a general exception to copyright such as the fair use provision in US copyright law.[51] Secondly, states could also permit the parallel importation of books pursuant to Article 6 of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement).[52] According to Article 6 of the TRIPS Agreement, for the purposes of dispute settlement, nothing in the TRIPS Agreement "shall be used to address the issue of the exhaustion of intellectual property rights." Thus, states are free to permit the parallel importation of books by adopting the principle of international exhaustion of copyright according to which the copyright in a book becomes exhausted once it is sold anywhere

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48 *Ibid.*

49 Report of the Special Rapporteur in the Field of Cultural Rights, Farida Shaheed, Copyright Policy and the Right to Science and Culture, A/HRC/28/57, (24 December, 2014), para 64.

50 *Ibid.*, para 104.

51 See S. 107 of the US Copyright Act.

52 On parallel importation and the doctrine of exhaustion, *see generally*, Shubha Ghosh, "The Implementation of Exhaustion Policies: Lessons from National Experiences", ICTSD Programme on Innovation, Technology and Intellectual Property, Issue Paper No. 40, (November 2013); Peter Yu, "A Spatial Critique of Intellectual Property Law and Policy", (2017) 74:4 Washington and Lee Law Review 2045, 2067-2073.

in the world.[53] In this regard, it should be noted that even the United States Supreme Court has ruled in favour of the application of the principle of international exhaustion in the context of US copyright law.[54]

Thirdly, states could introduce exceptions to facilitate access for individuals with visual impairments pursuant to the Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind, Visually Impaired or otherwise Print Disabled of 2013 (Marrakesh Treaty). The Marrakesh Treaty requires state parties to fulfil two main obligations: one, provide for a limitation or an exception to copyright in order to allow beneficiaries and authorised entities to undertake any changes needed to make a copy of a work in a format accessible for persons with a print disability, and; two allow the cross-border exchange of those accessible copies produced according to the limitations/exceptions.[55] Finally, states could also implement an exception permitting the use of literary and artistic works for teaching purposes pursuant to Article 10(2) of the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention). A very good model in this regard is Section 52(1)(i)(i) of the Indian Copyright Act which provides that the reproduction of any work "by a teacher or a pupil in the course of instruction" shall not constitute copyright infringement. This particular provision is discussed further in part three below.

B. The Responsibilities of Book Publishing Companies to Respect the Right to Education

Having analysed the obligations of states with regard to the right to education, it is necessary to examine the right to education responsibilities of corporate actors that are copyright owners. In this regard, it should be noted that the UN Human Rights Council has endorsed the view contained in

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[53] *See*, Ghosh, *ibid*., 9.

[54] See, *Kirtsaeng* v. *John Wiley & Sons Inc*., 568 US 519 (2013).

[55] *See generally*, WIPO, *Main Provisions and Benefits of the Marrakesh Treaty (2013)*, (2016), 4. *See further*, Hope Lewis, "Introductory Note to Marrakesh Treaty to Facilitate Access to Published Works for Persons Who are Blind, Visually Impaired, or Otherwise Print Disabled", (2013) 52:6 International Legal Materials 1309; Jingyi Li, "Facilitating Access to Digital Content for the Print Disabled: The Need to Expand Exemptions to Copyright Law", (2015) 27:3 Intellectual Property Journal 355; Lida Ayoubi, "The Marrakesh Treaty: Fixing International Copyright Law for the Benefit of the Visually Impaired Persons", (2015) 13:2 New Zealand Journal of Public & International Law 255; Andrea Wechsler, "WIPO's Global Copyright Policy Priorities: The Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled", in Herrmann, Krajewski, and Terhechte J. (eds.) *European Yearbook of International Economic Law*, vol. 6 (Springer, 2015); Margaret Ann Wilkinson, "International Copyright: *Marrakesh* and the Future of Users' Rights Exceptions", in Mark Perry (ed.), *Global Governance of Intellectual Property in the 21st Century*: *Reflecting Policy Through Change* (Springer, 2016) pp.107-127.

the Guiding Principles on Business and Human Rights (hereinafter, Guiding Principles) that, while states bear the primary duty to respect, protect, and fulfil human rights, corporate actors equally have a responsibility to respect human rights.[56] According to the Guiding Principles, the responsibility to respect human rights means that corporate actors "should avoid infringing on the human rights of others and should address adverse human rights impacts with which they are involved."[57]

In this context, two key responsibilities of book publishing companies in relation to the right to education can be identified. Firstly, book publishing companies have a responsibility to respect the copyright policy space of states. Crucially, while international copyright law (as embodied in the relevant treaties on copyright) does contain minimum standards that states must implement, there is still some policy space left that states can utilise to tailor their national copyright laws to meet their socio-economic needs.[58] In this regard, and as noted above, there are a number of exceptions and limitations to copyright that a state can implement at the national level to facilitate access to learning and teaching materials.

This implies that corporate actors (including book publishing companies) should not engage in lobbying activities to demand for curtailing the scope of existing limitations and exceptions to copyright law or put pressure on states to discourage them from implementing such limitations and exceptions. Such activities, which might ultimately result in impeding students and teachers from gaining access to learning materials, show a disrespect for the right to education.

Secondly, book publishing companies have a responsibility to respect the rights of users seeking to rely on limitations and exceptions to copyright to gain access to learning materials. For instance, where a state has specifically implemented an exception permitting the use of copyright protected works for teaching purposes, a book publishing company would be disrespecting the right to education by using litigation or the threat of litigation to compel

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[56] *See*, Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, John Ruggie, *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework*, UN Human Rights Council, A/HRC/17/31, (21 March, 2011).

[57] *Ibid*., Principle 11.

[58] *See* for instance, Art. 8(1) of the TRIPS Agreement which provides that, "Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement."

an educational institution to obtain a licence and pay royalties prior to making use of such works for teaching purposes.

Thus, while laudable, the responsibilities of corporate actors (especially book publishers) in relation to respecting the right to education go beyond merely donating books.[59] Book publishers should also not conflate the corporate responsibility to respect human rights with corporate social responsibility (CSR).[60] The corporate responsibility to respect human rights, unlike corporate social responsibility, has its foundations in international human rights law and (as noted above) it has received the endorsement of the UN Human Rights Council.[61]

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[59] *See* for instance, Harper Collins Publishers, *Corporate Social Responsibility*, (2018) available at < http://corporate.harpercollins.com/us/corporate-social-responsibility> (noting that, "HarperCollins supports local communities through volunteer efforts, book donations and support for local charitable organizations through innumerable local activities."); Penguin Random House, "Social Responsibility," (2018) available at <https://www.penguinrandomhouse.com/about-us/social-responsibility/> (noting that, "Penguin Random House actively supports many local and national organizations around the world that are aligned with its mission to foster a universal passion for reading. Whether it's through supporting literacy-based organizations, providing volunteers, donating books or creating unique collaborations that benefit readers, we find ways to partner hand-in-hand with communities.").

[60] For instance, in its "Partner Code of Conduct", Oxford University Press relegates the right to education to the section on social responsibilities where it notes that: "We *support* universal human rights including equal employment rights, safe workplaces, freedom of speech and of association, and the rights of all to an education." This can be contrasted with its statement on intellectual property rights (contained in a separate section of the same document) where it states clearly that: "We *protect* OUP's intellectual property (trademarks, design rights, copyrights, proprietary information, and trade secrets) at all times. We *respect* intellectual property rights throughout the world, including the intellectual property rights of our business partners, and equally we expect our business partners to respect OUP's intellectual property rights." (Italics mine). *See*, Oxford University Press, Partner Code of Conduct, (October 2017), 8-9, available at < http://fdslive.oup.com/www.oup.com/Group_comms/pdf/Partner%20Code%20of%20Conduct/OUP%20Partner%20CoC%20English%202017.pdf>

[61] *See generally*, Christopher Avery, "CSR and Human Rights", Corporate Citizenship Briefing, (26 September, 2006) available at <https://ccbriefing.corporate-citizenship.com/2006/09/26/csr-and-human-rights/> (noting that, "Sometimes the relationship between CSR and human rights is not properly understood. They have very different meanings … A CSR approach tends to be top-down: a company decides what issues it wishes to address. Perhaps contributing to community education, healthcare or the arts. Or donating to disaster relief abroad. Or taking steps to encourage staff diversity or reduce pollution. These voluntary initiatives should be welcomed. But a human rights approach is different. It is not top-down, but bottom-up – with the individual at the centre, not the corporation. Human rights are based on the inherent dignity of every person; they are those basic rights and freedoms to which all humans are entitled. They have been spelled out in internationally agreed standards, including the Universal Declaration of Human Rights … When it comes to human rights, companies do not get to pick and choose from a smorgasbord those issues with which they feel comfortable.)."

In essence, a corporate actor fails to respect the right to education when it abuses its copyright such that it impedes the ability of teachers and students to gain access to teaching and learning materials. Importantly, a corporate actor fails to respect the right to education when it uses litigation or threats of litigation to prevent teachers and students from relying on the limitations and exceptions to copyright that a state has incorporated into its national copyright law to facilitate access to teaching and learning materials. As stated in the Guiding Principles, corporate actors should "comply with all applicable laws and respect internationally recognized human rights, wherever they operate."[62]

Where a corporate actor disrespects the right to education by abusing its copyright, the copyright misuse doctrine can potentially be used to hold it accountable for its actions. As Olson points out, the copyright misuse doctrine "is an equitable defense similar to the common law doctrine of unclean hands. It is based on the notion that courts should deny any relief to a plaintiff if he has come to the court while engaging in improper behaviour himself … a finding of copyright misuse bars the plaintiff from recovering any damages or injunctive relief for so long as the misuse continues."[63]

In summary, states bear the primary responsibility to respect, protect and fulfil the right to education. This entails incorporating a right-to-education perspective into the design, revision, interpretation, and enforcement of national copyright laws. Furthermore, states have a duty to facilitate access to learning and teaching materials through the incorporation of limitations and exceptions into their national copyright laws. However, corporate actors equally have a responsibility to respect the right to education. This also means that, where a state has taken steps to incorporate limitations and exceptions into its national copyright law, corporate actors should comply with this national law as this is part of their obligation to respect human rights. The responsibility to respect the right to education also implies that corporate actors (such as book publishing companies) that own copyright should not use their monopoly to prevent teachers and students from relying on such limitations and exceptions to gain access to learning and teaching materials.

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[62] Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, John Ruggie, *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework*, UN Human Rights Council, A/HRC/17/31, (21 March, 2011), Principle 23(a).

[63] David Olson, "First Amendment Based Copyright Misuse", (2010) 52 Wm. & Mary L. Rev. 537, 570. *See also*, John Cross and Peter Yu, "Competition Law and Copyright Misuse", (2008) 56 Drake L. Rev. 427.

A case that demonstrates the need to reframe the responsibility of corporate actors that own copyright as a human rights issue is the Delhi University Photocopy case.[64] This case shows the impact that copyright can have on access to learning and teaching materials. It equally illustrates how the failure of book publishing companies to respect the right to education can impede the enjoyment of this right. This case will be the focus of the analysis in part three below.

IV. The Delhi University Photocopy Case

A. The Trial Court

This dispute was instituted before the Delhi High Court by five book publishing companies (Oxford University Press, Cambridge University Press (UK), Cambridge University Press (India Pvt. Ltd.), Taylor & Francis Group (UK), and Taylor & Francis Books (India Pvt. Ltd.) against both Rameshwari Photocopy Services (operating on the premises of the Delhi University) and Delhi University.[65] The plaintiffs sought a permanent injunction to restrain the defendants from infringing the plaintiffs' copyright through the photocopying of extracts from publications belonging to the plaintiffs and the compilation of these extracts into course packs for sale to students.[66]

The dispute centred on the meaning and scope of Section 52(1)(i)(i) of the Indian Copyright Act which provides that the reproduction of any work "by a teacher or a pupil in the course of instruction" shall not constitute infringement of copyright. While the defendants sought to rely on this provision, the plaintiffs contended that this provision is inapplicable to the case. Importantly, the plaintiffs argued for a narrow interpretation of this provision to confine it to only uses that occur in a classroom and not before or afterwards. The defendants however argued for a broad construction that "would include anything in the process of instruction with the process

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[64] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386 (Delhi High Court); affirmed in part and remanded with instructions on appeal in *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 6229 : (2017) 69 PTC 123.

[65] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386, para 1. It should be noted that two parties i.e. the Association of Students for Equitable Access to Knowledge (ASEAK) and the Society for Promoting Educational Access and Knowledge (SPEAK) were upon their own request subsequently added as defendants in the case.

[66] *Ibid*.

commencing at a time earlier than the time of instruction, at least for a teacher, and ending at a time later, at least for a student."[67]

However, from the arguments presented before the trial court, it appears that the main goal of the plaintiffs was to compel the defendants to obtain a licence and prevent them from relying on Section 52(1)(i).[68] This attitude displays a failure to respect the right to education. The plaintiffs' demand that the defendants obtain a licence prior to the production of course packs would have defeated the objective behind the inclusion of Section 52(1)(i) in the Indian Copyright Act and would have further impeded the access to affordable teaching and learning materials. The defendants however dismissed the plaintiffs' demand for a licence as unnecessary since the use in contention is already covered by Section 52.[69]

On their own part, the defendants contended, among other things, that as a developing country, very few people can afford the cost of education in India and that Indian students had lower purchasing power when compared with students from other jurisdictions.[70] The defendants grounded their argument for a broad construction of Section 52(1)(i) in the fact that it would be unrealistic to expect the students to buy all the expensive textbooks that contained the different chapters that were prescribed in the university's syllabus.[71]

The defendants also incorporated a human rights perspective into their argument. According to the defendants, though the dispute involved copyright law, it had to be adjudicated "in the light of the right to access to knowledge."[72] The defendants, citing Article 26(1) of the Universal Declaration of Human Rights, observed that the right to education is a fundamental right in India and that "access to education is a cherished constitutional value and includes within it access for students to books in [the] library and [the] right to research and to use all materials available."[73]

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[67] *Ibid*., para 15 (argument of counsel for SPEAK).

[68] *Ibid*., para 14 ("…what the plaintiffs are wanting is only a paltry licence fee and on obtaining such licence, the course packs can be made in terms of the said licence.") See further, *ibid*., para 20 ["…the objective of this litigation is not to compel the buying of books but to compel the defendant (Delhi University) to enter into a licensing agreement…"].

[69] *Ibid*., para 15 (argument of counsel for SPEAK characterising the exception in S. 52(1)(*i*) as a "right".).

[70] *Ibid*., para 15 (argument of counsel for SPEAK citing Liang (n 17) to support its contention that "the cost of books in proportion to the average income in India was high".).

[71] *Ibid*.

[72] *Ibid*, para 18 (argument of counsel for Delhi University).

[73] *Ibid*.

It should be noted that, initially, the right to education was non-justiciable and only part of the Directive Principles of State Policy under India's Constitution.[74] Subsequently, the Indian Supreme Court interpreted the right to life in Article 21 of the Indian Constitution to include the right to education.[75] In a later decision, the Indian Supreme Court ruled that every citizen has a right to education and the state has a duty to endeavour to provide educational facilities at all levels for the citizens.[76] This approach was however later modified in another decision where the Supreme Court ruled that the right to free education is only available to children until they are 14 years old, thereafter the duty of the state to provide education is subject to the limits of the state's economic capacity.[77] In 2002, via a Constitutional Amendment, the right to education was incorporated into the Indian Constitution as a fundamental right albeit confined to the free education of children aged between six and fourteen years.[78] Thus, since the right to education is a fundamental right in India, the state has an obligation to incorporate a human rights perspective into the design and interpretation of its national copyright law.

In its decision, the trial court agreed with the defendants that the question of obtaining a licence would only arise if the defendants' activities are not covered by Section 52 of the Copyright Act.[79] In holding that the actions of the defendants did not amount to copyright infringement, the court adopted a broad interpretation of Section 52(1)(i). According to the trial court,

> "…the words 'in the course of instruction' within the meaning of Section 52(1)(i) … would include reproduction of any work while the process of imparting instruction by the teacher and receiving instruction by the pupil continues i.e. during the entire academic session for which the pupil is under the tutelage of the teacher and that imparting and receiving of instruction is not limited to [the] personal interface between teacher and pupil but is a process commencing from the teacher readying herself/himself for imparting instruction, setting syllabus, prescribing text books, readings and ensuring … that the pupil stands instructed in what he/she has approached the teacher to learn. Similarly the words 'in the course of instruction' … have to

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[74] Liang, (n 17), 199.

[75] See, *Francis Coralie Mullin* v. *UT of Delhi*, (1981) 1 SCC 608 : AIR 1981 SC 746.

[76] *Mohini Jain* v. *State of Karnataka*, (1992) 3 SCC 666.

[77] *Unni Krishnan, J.P.* v. *State of A.P.*, (1993) 1 SCC 645.

[78] *See*, Art. 21-A of the Indian Constitution which provides that, "The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine."

[79] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386, para 23.

> include within their ambit the prescription of syllabus the preparation of which both the teacher and the pupil are required to do before the lecture and the studies which the pupils are to do post lecture…"[80]

Notably, in its decision, the trial court adopted a socio-centric view of copyright as it held that copyright is not a natural right that confers absolute ownership but "is designed rather to stimulate activity and progress in the arts for the intellectual enrichment of the public."[81] The trial court was also mindful of the need to facilitate access to learning materials. It agreed with the defendants that the students cannot be expected to buy all the prescribed books and thus they cannot be seen as potential customers of the plaintiffs.[82]

B. The Division Bench

The plaintiffs subsequently filed an appeal before the Division Bench of the Delhi High Court.[83] At this stage, apart from the arguments already canvassed by both parties before the trial court which were equally repeated before the Division Bench, one of the key points of disagreement between the parties was whether Section 52(1)(i) gives teachers and students an absolute right to make copies of works or whether it is subject to a 'fairness' requirement.[84] The plaintiffs (now appellants) contended that a 'fair use' requirement should be read into Section 52(1)(i) and that the preparation of course packs pursuant to this provision would not be a 'fair use.'[85]

In its decision, while no explicit reference was made to the right to education, the Division Bench still nevertheless acknowledged the importance of education. According to the court, "education is the foundation on which a progressive and prosperous society can be built."[86] The court equally emphasized the need to promote "equitable access to knowledge to all segments of the society, irrespective of their caste, creed and financial position" and it noted that "the more indigent the learner, the greater the responsibility to ensure equitable access."[87] Thus, the court implicitly acknowledged that the state has a duty to facilitate access to learning materials, especially for indigent students.

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[80] *Ibid*., para 72.
[81] *Ibid*., para 80.
[82] *Ibid*, para 87.
[83] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 6229 : (2017) 69 PTC 123.
[84] *Ibid*., para 17.
[85] *Ibid*., para 27.
[86] *Ibid*., para 30.
[87] *Ibid*.

In relation to the appellants' contention that a fairness requirement should be read into Section 52(1)(i), the court noted that "there has to be fairness in every action."[88] While acknowledging that Section 52(1)(i) is not explicitly subject to a fairness requirement, it noted that "unless the legislative intent expressly excludes fair use, and especially when [the] results of [a person]'s labour is being utilized by somebody else, fair use must be read into the statute."[89] The court therefore held that the general principle of 'fair use' should be read into Section 52(1)(i).[90] However, the court clarified that, by incorporating 'fair use' into this provision, it was not adopting the American approach to fair use as contained in Section 107 of the US Copyright Act.[91]

Moreover, the court ruled that 'fair use' with regard to Section 52(1)(i) should be determined by the purpose of the use.[92] According to the court:

> "In the context of teaching and use of copyrighted material, the fairness in the use can be determined on the touchstone of 'extent justified by the purpose'. In other words, utilization of the copyrighted work would be a fair use to the extent justified for the purpose of education. It would have no concern with the extent of material used, both qualitative or quantitative … so much of the copyrighted work can be fairly used which is necessary to effectuate the purpose of the use i.e. make the learner understand what is intended to be understood."[93]

The court's approach in this regard is consistent with the incorporation of a right-to-education perspective into the interpretation of copyright law. This approach is in accordance with the obligation of the state to respect the right to education as it will ensure that teachers and students can make copies of works without any restrictions as to quality or quantity as long as it is for an educational purpose.

The court also agreed with the broad interpretation given to the phrase 'in the course of instruction' by the trial court.[94] It however remanded the case back to the trial court with instructions to determine whether the materials included in the course packs produced by the defendants were justified for educational purposes i.e., for instructional use by teachers.[95] It also asked

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[88] *Ibid*., para 31.
[89] *Ibid*.
[90] *Ibid*.
[91] *Ibid*.
[92] *Ibid*., para 32.
[93] *Ibid*., para 33.
[94] *Ibid*., para 50.
[95] *Ibid*., para 56.

the trial court to determine whether photocopying of entire books would be permissible.[96]

However, given the reasoning of the court in its interpretation of Section 52(1)(i), it could be argued that the issues which the Division Bench requested the trial court to consider had already become moot. One can only imagine that it would not have been too difficult for the defendants to establish that the materials included in the course packs were justified for educational purposes. Furthermore, as the Division Bench had already ruled that copyright protected works can be used without any qualitative or quantitative restrictions as long as it is necessary for educational purposes, it is unclear why it was thought necessary to still request that the trial court should determine whether the photocopying of entire books would be a permissible activity.

Perhaps, reading the handwriting on the wall, it is not surprising that a few months after the decision of the Division Bench, the appellants announced that they were withdrawing the suit and they were not going to appeal to the Indian Supreme Court.[97] While some of the arguments canvassed by the appellants before the courts in this case indicate a disrespectful attitude towards the right to education, in their joint statement, the appellants note that they "support and seek to enable equitable access to knowledge for students."[98] They also claim to "understand and endorse the important role that course packs play in the education of students."[99] If these statements by the appellants are a reflection of a change of attitude on their part, they provide an illustration of what one would expect from corporate actors that intend to respect the right to education.

C. Section 52(1)(i) and International Copyright Law

A final question that needs to be addressed is whether Section 52(1)(i) and its interpretation by the Indian courts in this case is consistent with India's obligations under international copyright law. This is important because, while Section 52(1)(i) and its interpretation by the Indian courts is obviously compatible with India's obligation under international human rights law, some might contend that it is in conflict with India's obligation under international copyright law. In this regard, the most relevant provisions are

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[96] *Ibid*., para 79.

[97] *See*, Joint Statement by Oxford University Press, Cambridge University Press and Taylor & Francis, (9 March, 2017) available at <http://fdslive.oup.com/asiaed/News%20Items%20and%20Images/Joint%20Public%20Statement.pdf>

[98] *Ibid*.

[99] *Ibid*.

Articles 9(2) and 10(2) of the Berne Convention and Article 13 of the TRIPS Agreement.

Importantly, Article 10(2) of the Berne Convention gives countries the freedom to permit the use of literary and artistic works by way of illustration in publications, or sound or visual recordings for teaching purposes.[100] It is however subject to two requirements. The use must be "to the extent justified by the purpose" and it must be "compatible with fair practice." As there are no quantitative restrictions in Article 10(2) of the Berne Convention,[101] it arguably provides a basis for countries to introduce exceptions into their copyright laws to permit the reproduction of textbooks and other learning materials in various forms including course packs. The extent of the reproduction should however be justified by the purpose of teaching and it must be compatible with fair practice. The Berne Convention however does not define "fair practice" and it is up to states to determine what constitutes "fair practice."[102]

Article 9(2) of the Berne Convention equally permits countries to introduce exceptions to the right of reproduction. However, such exceptions should be in certain special cases, should not conflict with a normal exploitation of the work, and should not unreasonably prejudice the legitimate interests of the author. These three requirements have subsequently become known as

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[100] Art. 10(2) of the Berne Convention provides that, "It shall be a matter for legislation in the countries of the Union, and for special agreements existing or to be concluded between them, to permit the utilization, to the extent justified by the purpose, of literary or artistic works by way of illustration in publications, broadcasts or sound or visual recordings for teaching, provided such utilization is compatible with fair practice."

[101] *See*, Sam Ricketson, WIPO Study on Limitations and Exceptions of Copyright and Related Rights in the Digital Environment, SCCR/9/7, Standing Committee on Copyright and Related Rights, Ninth Session, (2003), 14.

[102] It should be noted that the expression "fair practice" also appears in Article 10(1) of the Berne Convention which deals with quotations. Writing in relation to the meaning of "fair practice" in the context of Art. 10(1) of the Berne Convention, Ricketson initially suggests that it "will be a matter for national tribunals to determine in each particular instance" but he also goes on to suggest that the criteria in Art. 9(2) of the Berne Convention (which deals with the three step test) "would appear to be equally applicable here in determining whether a particular quotation is 'fair,' namely whether it conflicts with a normal exploitation of the work and unreasonably prejudices the legitimate interests of the author." *See*, Ricketson, (n 101), 13. Aplin and Bently however reject the view that the meaning of "fair practice" should be left to countries or that it should be synonymous with the three-step test. According to them, fair practice "has an autonomous and pluralistic meaning that embraces notions of moral and economic harm, distributive justice concerns, freedom of expression principles, and, in limited circumstances, custom." *See*, Tanya Aplin and Lionel Bently, "Displacing the Dominance of the Three-Step Test: The Role of Global, Mandatory Fair Use", in Wee Loon Ng, Haochen Sun, and Shyam Balganesh (eds.), *Comparative Aspects of Limitations and Exceptions in Copyright Law*, (Cambridge University Press, 2018) [Forthcoming], 10-11, available at <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3119056>.

the three-step test. It should however be noted that the teaching exception contained in Article 10(2) of the Berne Convention is distinct from and not subject to the three-step test in Article 9(2) of the Berne Convention.[103]

Both Articles 9(2) and 10(2) of the Berne Convention were incorporated into the TRIPS Agreement via Article 9(1) of the TRIPS Agreement which requires members to comply with both provisions. However, the TRIPS Agreement also contains its own version of the three-step test in the context of copyright. Article 13 of the TRIPS Agreement requires states to "confine limitations or exceptions to exclusive rights to certain special cases which do not conflict with a normal exploitation of the work and do not unreasonably prejudice the legitimate interests of the right holder." Thus, the TRIPS Agreement appears to have expanded the scope of the three-step test. Under the TRIPS Agreement, the test is no longer confined to just the right of reproduction (as contained in Article 9(2) of the Berne Convention), the test now applies to all types of exclusive rights. Furthermore, 'author' in Article 9(2) of the Berne Convention has been replaced with 'right holder' in Article 13 of the TRIPS Agreement.

This development has raised the question as to whether Article 10(2) of the Berne Convention is now subject to the three-step test in Article 13 of the TRIPS Agreement. This question is important because of the uncertainty surrounding the meaning and application of the three-step test.[104] If Article 10(2) of the Berne Convention is not subject to Article 13 of the TRIPS Agreement, then countries need not worry about the three-step test when trying to introduce the teaching exception. There is however a divergence of opinion on whether or not Article 13 of the TRIPS Agreement applies to Article 10(2) of the Berne Convention.

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[103] As noted in the Records of the Stockholm Conference of 1967 where Art. 9(2) of the Berne Convention was introduced, "The Drafting Committee was unanimous in adopting, in the drafting of new texts as well as in the revision of the wording of certain provisions, the principle *lex specialis legi generali derogat*: special texts are applicable, in their restricted domain, exclusive of texts that are universal in scope. For instance, it was considered superfluous to insert in Art. 9, dealing with some general exceptions affecting authors' rights, express references to Arts. 10, 10*bis*, 11*bis* and 13 establishing special exceptions." *See*, WIPO, *Records of the Intellectual Property Conference of Stockholm, June 11 to July 14, 1967*, vol. II, (Geneva, 1971), 1134.

[104] *See*, Report of the Special Rapporteur in the Field of Cultural Rights, Farida Shaheed, "Copyright Policy and the Right to Science and Culture", A/HRC/28/57, (24 December, 2014), para 75 (noting in relation to the three-step test that, "considerable disagreement and uncertainty remains about how to interpret and apply the standard, leaving many countries hesitant to innovate."); *See also*, Lawrence R. Helfer, "World Music on a US Stage: A Berne/TRIPS and Economic Analysis of the Fairness in Music Licensing Act", (2000) 80 B.U. L. Rev. 93, 147 (noting that, "The proper construction of article 13's 'three-step' test is among the most uncertain and contested issues in international copyright law.").

On the surface, Article 13 of the TRIPS Agreement seems to apply to all limitations and exceptions including those contained in the Berne Convention and this is the view of some scholars.[105] In addition, in *United States - Section 110(5) of the US Copyright Act,* a World Trade Organization (WTO) dispute settlement panel took the view that Article 13 of the TRIPS Agreement is not confined to the exclusive rights newly introduced via the TRIPS Agreement.[106] If this first view is correct, it implies that any exception introduced by a country on the basis of Article 10(2) of the Berne Convention must also comply with the three step test in Article 13 of the TRIPS Agreement.

A second view is that Article 10(2) of the Berne Convention is already compatible with the three-step test. According to Ricketson, "the references to being 'compatible with fair practice' may correspond to the second and third steps of the three-step test, while the limited scope of [Article 10(2)] undoubtedly brings [it] within the first step" and therefore the requirement of Article 10(2) of the Berne Convention overlaps with Article 13 of the TRIPS Agreement and there is no conflict.[107] The obvious danger with this approach is that it exposes some of the exceptions that are expressly not subject to the three-step test under the Berne Convention to the vagaries and unpredictability of the application of the three-step test. Thus, a country might find its teaching exception enacted pursuant to Article 10(2) of the Berne Convention being successfully challenged before a WTO dispute settlement panel.

A third view, and one which this paper agrees with, is that Article 13 of the TRIPS Agreement does not apply to Article 10(2) of the Berne Convention. According to Okediji, "given the structure of the Berne Convention, the

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[105] *See*, for instance, Ricketson, (n 101), 47 (noting that, "as Art. 9(1) of TRIPS requires members to comply with Arts. 1 to 21 of Berne (other than Art. 6*bis*), the better view must be that Art. 13 applies to all the exclusive rights listed in Berne, including that of reproduction").

[106] World Trade Organization, United States - Section 110(5) of the US Copyright Act, WT/DS160/R (15 June, 2000), para 6.80. However, since the relationship between Art. 10(2) of the Berne Convention and Art. 13 of the TRIPS Agreement was not the focal point of the panel's decision, the question remains open. *See*, Aplin and Bently, (n 102), 13; Jo Oliver, "Copyright in the WTO: The Panel Decision on the Three-Step Test", (2001) 25 Colum. J.L. & Arts. 119, 147.

[107] Ricketson, (n 101), 52. *See also*, WIPO, *The Implications of the TRIPS Agreement on Treaties Administered by WIPO*, WIPO publication No. 464(E), (1996), paras 22-23 (noting in relation to Art. 13 of the TRIPS Agreement that, "None of the limitations and exceptions permitted by the Berne Convention should, if correctly applied, conflict with the normal exploitation of the work and none of them should, if correctly applied, prejudice unreasonably the legitimate interests of the right holder. Thus, generally and normally, there is no conflict between the Berne Convention and the TRIPS Agreement as far as exceptions and limitations to the exclusive rights are concerned.").

three-step test does not extend to a state exercise of discretion pursuant to those Articles where such discretion has explicitly been granted, such as [Article 10(2)]. Thus, states may freely enact legislation with respect to [Article 10(2)] without the restrictions of the three-step test."[108] In the same vein, Liang invokes the *lex specialis* principle to contend that, as a specific provision that deals with teaching and education, Article 10(2) of the Berne Convention should not be subject to the more general provision contained in Article 13 of the TRIPS Agreement.[109] A country that adopts this approach can, pursuant to Article 10(2) of the Berne Convention, introduce a teaching exception into its national copyright law without worrying about the three-step test.

The Indian courts also had to grapple with this question in the Delhi University Photocopy case. At the trial court, in determining whether Section 52(1)(i) of the Indian Copyright Act is compatible with India's obligations under international copyright law, there was a conflation of Articles 9(2) and 10(2) of the Berne Convention and Article 13 of the TRIPS Agreement. According to the trial court,

> "...under the Berne Convention ... the only binding obligation on the ... countries is to in their respective legislations (i) not permit the reproduction of the work so as to conflict with a normal exploitation of the work and so as to unreasonably prejudice the legitimate interest of the author; and, (ii) to while permitting utilization of the literary works including in publications for teaching ensure that such utilization is to the extent justified by the purpose and compatible with fair practice. Similarly, under the TRIPS Agreement also the member countries have agreed to confine the exceptions to the copyright to the extent they do not unreasonably prejudice the legitimate interest of the right holder."[110]

Thus, the trial court did not consider each of these provisions separately. The trial court further held that "India, under the international covenants ... has the freedom to legislate as to what extent utilisation of copyrighted

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[108] *See*, Ruth Okediji, *The International Copyright System: Limitations, Exceptions and Public Interest Considerations for Developing Countries*, UNCTAD-ICTSD Project on IPRs and Sustainable Development, Issue Paper No. 15, (March 2006), 14. *See also*, Gwen Hinze, *Making Knowledge Accessible Across Borders: The Case for Mandatory Minimum International Copyright Exceptions and Limitations for Education, Capacity Building and Development*, Electronic Frontier Foundation, (October 2008), 3, available at <https://files.eric.ed.gov/fulltext/ED509860.pdf>

[109] Liang, (n 17), 220.

[110] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 5128 : (2016) 68 PTC 386, para 95.

works for teaching purpose is permitted but agreed to ensure that the same is to the extent 'justified by the purpose' and does not 'unreasonably prejudice the legitimate rights of the author.'"[111] The trial court took the view that Indian legislators had the provisions of both the Berne Convention and the TRIPS Agreement in mind when they enacted Section 52(1)(i) and it was not willing to interfere with the decision of the legislators in this regard.[112]

On appeal, the Division Bench did not fare any better in this regard. According to the Division Bench,

> "Nothing much turns on Article 13 of the TRIPS Agreement and Article 9 of the Berne Convention for the reason that the contents thereof are merely directory and have enough leeway for the signatory countries to enact the copyright law in their municipal jurisdiction concerning use of copyrighted works for purposes of dissemination of knowledge."[113]

It appears that the Division Bench simply assumed that Section 52(1)(i) is compatible with the three-step test. It is however doubtful if the making of course packs through the reproduction of multiple copies of copyright protected works without obtaining a licence from the copyright owner would withstand a challenge before a WTO dispute settlement panel. It is not implausible or unreasonable to predict that a WTO panel might hold that the production of course packs unreasonably prejudices the legitimate interests of a copyright owner. It is suggested here that Article 10(2) of the Berne Convention provides a stronger normative basis for both the trial court's and the Division Bench's interpretation and application of Section 52(1)(i) of the Indian Copyright Act. If one takes the view that Article 10(2) of the Berne Convention is not subject to the three-step test, then arguably Section 52(1)(i) and the decision of the Indian courts in the Delhi University Photocopy case is compatible with international copyright law.

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[111] *Ibid*., para 96.

[112] *Ibid*., para 97 (noting that, "It is not for this Court to impose its own wisdom as to what is justified or what is unreasonable, to expand or restrict what the legislators have deemed fit. The legislature is not found to have imposed any limitation on the extent of reproduction. Once the legislature … take a call on what is justified for the purpose of teaching and what will unreasonably prejudice the legitimate interest of the author [and] has not imposed any such limitation, this Court cannot impose the same.").

[113] *University of Oxford* v. *Rameshwari Photocopy Services*, 2016 SCC OnLine Del 6229 : (2017) 69 PTC 123, para 63.

V. Conclusion

Since states bear the primary responsibility with regard to the right to education, states should ensure that they incorporate a right-to-education perspective into the design, interpretation, and enforcement of their national copyright laws. However, corporate actors also have a responsibility to respect human rights including the right to education. Thus, companies that own copyright in learning materials (such as book publishers) equally have a responsibility to respect measures that states have introduced into their national copyright laws to facilitate access to learning materials. Furthermore, corporate actors that own copyright in learning materials should not use litigation or the threat of litigation to try to prevent teachers and students from relying on limitations and exceptions to copyright to gain access to learning materials.

Plant Breeders' Rights, Farmers' Rights and Food Security: Africa's Failure of Resolve and India's Wobbly Leadership*

*Chidi Oguamanam***

Abstract *Since 2000s, Africa and India severally rejected the notion that UPOV's 1991 standard of Plant Breeders Rights (PBRs) is the only route to fulfil their obligations under Article 27 of the TRIPs Agreement. Objecting to the exclusive focus of the UPOV regime on formal plant breeders, African countries insisted on a holistic approach to plant breeders' rights to include protection for rights of communities, farmers and their indigenous knowledge, innovation and practices. Consequently, under the African Union's (AU) auspices, Africa proposed the Model Law for the Protection of the Rights of Local Communities and Breeders, and for Regulations of Access to Biological Resources. Self-evidently, the law not only recognises the centrality of the smallholder indigenous and local community farmers on the continent's food production, it also underscores the interconnectedness of biodiversity conservation, farmers' rights, traditional knowledge, access and benefit sharing over genetic resources within then emergent international regimes. Nearly two decades after, Africa's resolve has proven*

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to be fickle. The continent has reversed itself and fully embraced the UPOV regime. At about the same time as the Model Law, India enacted the Protection of Plant Varieties and Farmers' Rights Act, 2001 – an instrument consistent with the spirit of Africa's Model Law. Both regimes take into account the role of local farmers as the backbone of agricultural innovation, food production and food security in the developing world, including Africa and India, thereby further enhancing the idea of farmers' rights in food and agriculture law and policy. This Article juxtaposes the circumstances around Africa's failure of resolve and India's wobbly experience over farmers' rights. It calls attention to farmers' rights as a site for a missed and yet potentially redeemable opportunity for both Africa and India to advance South-South solidarity for food security.

Part I

I. Introduction

Against all odds, Donald John Trump was elected the 45th President of the United States of America in 2016. Despite their disposition to the contrary, that victory came as a surprise to Trump himself and his ardent supporters. "Making America Great Again", whatever that means, was Trump's campaign slogan which at the time of writing this Article is unfolding simultaneously as Trump hitherto unlikely presidency. Having touted his deal-making credential[1] as a businessman during the campaigns, Donald Trump has collapsed those skills, or so he thinks, onto his presidency and is determined to get every extra mileage from America's factor endowments as a strategy of engagement with the rest of the world, especially on the trade and general economic fronts. Trump has ruffled, rattled and stirred existing free trade agreements and entrenched diplomatic conventions via muscular hard-balling, unilateral imposition of import tariffs, arm-twisting and carrot-and-stick approach, etc. By these brusque measures, he has coerced America's competitions, notably China, Europe, South Korea, even Canada and Mexico; stoking the possibility of a full-blown trade war with his eyes set on hitherto unimaginable concessions.[2] On the economic and

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1 *See*, Donald J. Trump (with Tony Schwartz) *Trump: The Art of the Deal* (2015).

2 *See*, The March 8, 2019 edition of *The Economist* magazine under the title of "The Threat to World Trade: The Rules-Based System is in Grave Danger" which focused on how Trump's imposition of tariffs on steel and aluminium risks dismantling the global trade order under the WTO system, <https://www.economist.com/news/leaders/21738362-donald-trumps-tariffs-steel-and-aluminium-would-be-just-start-rules-based-system>.

related fronts, the casualties or near-casualties of Trumpism include the Trans-Pacific Partnership Trade (TPP) deal, the North America Free Trade Agreement (NAFTA), the Paris Climate Change Agreement and counting.[3] Undergirding Trump's bravado are America's strongest and all-time secret weapons – its sheer size and market power and its factor endowments in strategic sectors such as technology, innovation, intellectual property, military might, natural resources, capital, services and their cumulative effect as negotiating bully arsenals.

In realpolitik, as in the Trump world factor endowments remain sacrosanct. They are used to leverage and negotiate desired interests. Despite its hawkish parochialism and legitimate doubts about its sustainability in the fast-changing global geopolitics, this received wisdom of American global engagement, now brazenly magnified by Trump, lends itself to selective or constructive adaptation – not necessary by any single country or political entity on a viable scale save perhaps China. But by way of alignment and deliberative mobilisation of comparative advantages across boundaries, countries and geopolitical spaces, it is possible for select states to consciously coalesce around shared or common interests and their distinct factor endowments in order to muster and optimize negotiation leverage. In analogous regard, smallholder farmers and traditional farming practices are key resourceful actors and sites for sustainable agricultural production and innovation as well as alternative epistemic agencies for tackling food insecurity in Africa and India. The rich endowment of those critical human and cultural resources place Africa and India in a strong comparative and negotiation advantage. Properly deployed, Africa and India's standing as centres of genetic and cultural diversity with rich agricultural heritage can be leveraged to re-position themselves against the current external pressures that have elevated plant breeding and other hi-tech proprietary-driven agricultural models as a self-serving unidirectional vision of agriculture which is often promoted by the Western countries at the expenses of other stakeholders such as smallholder farmers of the global south. Africa and India's

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[3] Not long after his election, Trump walked United States out of the TPP and led the country to abandon the Paris Climate Change Agreement affirming his position as a climate change denier. He has since forced ongoing renegotiation of the NAFTA with Canada and Mexico under a cloud or threat of America's willingness to walk out of the 25-year-old regional trade accord. As at the time of the present study, Trump has by executive order imposed higher import tariffs on foreign steel (25%) and aluminium (10%) while threatening to follow suit for automobiles thereby ruffling nerves in China, Japan, and the European Union. *See*, Philip Blenkinsop & Alissa de Carbonnel, "EU, Japan Start Push for Exemptions from Trump Tariffs", Reuters (March 10, 2018, 12:06 P.M.), <https://www.reuters.com/article/us-usa-trade-europe/eu-japan-start-push-for-exemptions-from-trump-tariffs-idUSKCN1GM0PZ>.

conjoined interest in the rights of farmers offers a basis for solidarity and, literally for self-defence and self-preservation in food security.

In this Article, I draw attention the prospects of Afro-Indo south-south solidarity around farmers' rights amidst rapid entrenchment of plant breeders' rights as a strategy to balance and consolidate Africa and India's factor endowments in sustainable agriculture and food security.[4] Symbolically, the rise of plant breeders' rights as a preferred proprietary protection strategy for innovation in plant genetic resources for food and agriculture is evidently representative of the head start of industrialized countries of Europe and, of course, the United States of America in agricultural innovation and transformations.[5] Whereas, the fledgling concept of farmers' rights designates the role of traditional, smallholder farmers and their farming practices as the bedrock of agricultural innovation, productivity and general lifestyles of many countries of the global south, including African countries and, of course, India. The interface of plant breeders' rights and farmers' rights in law and policy making at international and various national levels evinces the tension in the negotiations of interests and outright tendencies of countries to exploit their factor endowments and comparative advantages against competing and rival interests. In these contestations of interests, while Europe and America have leveraged their advanced R&D in plant breeding to project plant breeders' rights, African countries and India have yet to broach, as a matter of solidarity, their conjoined interest in farmers' rights. Rather, they seem to send mixed signals on the subject with half-hearted resolve – a disposition that has negative ramification for food security in the regions.

Not counting the concluding section, this Article is divided into three major sections, which includes the present introduction. The second section outlines the global context for the two similar pathways that characterise the trajectory of farmers' rights and their interface with plant breeders' rights

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[4] *See*, Habir Singh, "Emerging Plant Variety Legislations and their Implications for Developing Countries: Experiences from India and Africa", Paper presented at the National Conference on TRIPS —Agenda for Developing Countries at Shyamprasad Institute for Social Sciences, Hyderabad, 11-12 October, 2002 (this was one of the earliest attempts to focus on developments in India and Africa over the protection of plant varieties since the early 2000s) (paper is on file with the present author).

[5] *See*, Graham Dutfield, "Turning Plant Varieties into Intellectual Property: The UPOV Convention", in *The Future Control of Food: A Guide to International Negotiations and Rules on Intellectual Property, Biodiversity and Food Security* 27-47 [Geoff Tansey and Tasmin Rajotte (eds.), 2008]; *see also*, Chidi Oguamanam, "Pressuring 'Suspect Orthodoxy': Traditional Knowledge and the Patent System", in, *Indigenous Intellectual Property: A Handbook of Contemporary Research* 313-333 [Matthew Rimmer (ed.), 2016].

in India and Africa within the framework of the International Union for the Protection of New Plant Varieties (UPOV) vis-a-vis earlier Organization of African Unity (OAU) or the African Union (AU) initiative on farmers' rights, on the one hand, and India's national legislative experience and cognate instruments on the subject, on the other. Focusing on food security and sustainability, the third part demonstrates the vital role of traditional knowledge-based informal farmers and smallholder farming communities in India and Africa as pivotal actors and cross-regional factor endowments for food security in India and on the African continent. The conclusion conjectures on the prospects of Afro-Indo solidarity over farmers' rights as a strategic approach to food security and for balancing of competing interests in global law and policy over plant genetic resources for food and agriculture.

Part II

II. In the Shadow of Plant Breeders' Rights

A. Global Context for Agro R&D and the Proprietary Expediency

Agriculture is an exercise that thrives on the natural regenerative capacity of genetic materials from plants, animals, microbes, fungi, etc. that are relevant to food, nutrition, and ecological sustainability. Some inherent factors do not lend these genetic materials to ease of proprietary control. These include their obligate regenerative capacity as mostly symbolised in seeds and their natural proclivity for dispersal not to mention their historic ubiquity as cultural resources readily exchanged or shared as integral aspects of communal or cultural lives and practices of many traditional societies world over.[6] Consequently, formal R&D and innovations in agriculture were largely undertaken through public investment as a form of public good.[7] But the ascent of free market economic order supervised a radical shrinkage in public investment in agricultural R&D.[8] That tide provided entry and pressure points for the campaign over proprietary protection of innovations in agriculture as a guarantee for private investment in the sector.[9]

Countries with a head start in formal seed breeding opted for a legal framework, notably plant breeders' rights, to protect their advantages in

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[6] See, *infra* note 23 and accompanying texts.
[7] *See*, Jack R. Kloppenburg, *First the Seed: The Political Economy of Plant Biotechnology* 1492-2000 (2004).
[8] *Ibid.*
[9] *Ibid.*

the field.[10] Given the rapid globalisation and opening up of markets, that framework takes an international imperative to condition proprietary seeds for global market access. It is epitomised by the UPOV, which is the major attempt at international protection, not necessarily of plant varieties as the name suggests, but more accurately of breeders' rights as a special form of intellectual property.[11] With the coming into effect of agricultural biotechnology, which is mainly a private sector-driven experience, it did not take long before subsisting reluctance to extend intellectual property protection to life forms, including plant genetic resources, were relaxed to extend patent protection over genetic resources-based innovations.[12]

In addition to the UPOV, intellectual property, specifically patent protection, for agricultural innovation is affirmed by the TRIPS agreement in Article 27.3(b).[13] It reads, in part: "Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof". The point needs to be made. In both UPOV and TRIPS, protection of plant varieties is not a benevolent public endeavour. Both instruments are economic or trade documents. Plant varieties protection therefore aims at protecting breeders. Under the UPOV and TRIPs, breeders are exclusive objects of legal rights for putatively breeding new plant varieties, i.e. those that meet the formal scientific criteria specified under law.[14]

Europe, the United States and leading plant breeding and agro-biotechnology countries have, over the years, favoured a consolidated approach to the protection of intellectual property in agriculture. To this end, advances in plant breeding have brought into line revisions and strengthening of plant breeders' rights, details of those are outside this scope of this Article.[15] Presently, the legal mechanism for the protection of PBRs is less of a *sui*

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[10] *See*, Dutfield, *supra* note 5; Oguamanam, *supra* note 5.

[11] Before UPOV, there were earlier attempts at national levels for sui generis systems of protection of plant varieties. See, UNCTAD-ICTSD, Resource Book on TRIPS and Development (2005), <https://www.iprsonline.org/unctadictsd/docs/UNCTAD_frontmatter.pdf>.

[12] *See*, Chidi Oguamanam, "Intellectual Property Rights in Plant Genetic Resources: Farmers' Rights and Food Security of Indigenous and Local Communities", 11 Drake Journal of Agricultural Law 273-305 (2006); *see also*, Kshitij K. Singh, "Intellectual Property Rights in Agricultural Biotechnology and Access to Technology: A Critical Appraisal", 18 Asian Biotechnology Development Review 3-23 (2016).

[13] *See*, Prabhash Ranjan, "Recent Developments in India's Plant Variety Protection, Seed Regulations and Linkages with UPOV Proposed Membership", 12 Journal of World Intellectual Property 219-243 (2009).

[14] For example, newness, distinctiveness, uniformity, and stability of proposed variety.

[15] *See*, however, Rolf Jordens, "Progress of Plant Variety Protection Based on International Convention for the Protection of New Varieties of Plants (UPOV Convention)", 27 World Patent Information 232-243 (2005).

generis model as it was originally intended. Now, it is akin to the stronger and more prescriptive and formalistic patent regime.[16] The real and potential convergence of PBRs with the patent regime nuances the melding of usually medium or smallholder plant breeding entities with omnibus agro-biotech transnational corporations reflecting and responding to the consolidation of the agro and allied industrial sectors.[17] These transnational corporations are interested in maximalist intellectual property protection. In the agricultural arena, the patent regime is that golden standard or form of such protection, even though there is now a faint line between patent protection and PBRs,[18] a situation that poses an existential threat to plant breeders themselves.[19]

The interfacing of R&D and technological advances in agriculture with legal and proprietary control of agricultural innovations provides an edge for the western and industrial model of agriculture and its archetypal capitalist process of innovation and knowledge creation. This is in contrast to such agricultural knowledge productions and innovations that rely on traditional practices of sharing and exchange of seeds and genetic materials. The emphasis and orientation of the first described model on proprietary and exclusive control of agricultural R&D and innovation naturally locate it in a position of conflict with less formal and open model of agricultural innovation and production that constitute now the prime traction for farmers' rights.[20]

Accurately or less inaccurately, by default, "farmers", are the presumed custodians of traditional agricultural knowledge and practices.[21] In this loose but pragmatic context of reference, optically, *farmers* designate smallholder or medium scale categories, mostly women, who are predominantly members of indigenous and local communities (or ILCs) mainly, but not exclusively, in the global south, including Africa and India. For this category,

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[16] *See*, Dutfield, *supra* note 5.

[17] *See*, IAASTD, Corporate Concentration in Agriculture: Findings from the UN-led International Assessment of Agricultural Knowledge, Science and Technology for Development Panna (2009), <https://www.panna.org/sites/default/files/CorporateControl-IAASTD-PANNABrief.pdf>.

[18] *See*, Dutfield, *supra* note 5; Oguamanam, *supra* note 5.

[19] *Ibid*.

[20] *See*, Craig Borowiak, "Farmers' Rights: Intellectual Property Rights and the Struggles over Seeds", 32 Politics & Society 511-543 (2004); *see also*, Chidi Oguamanam, "Open Innovation in Plant Genetic Resources for Food and Agriculture", 13 Chicago-Kent Journal of Intellectual Property 11-50 (2009).

[21] Other stakeholders steeped in conventional plant breeding, R&D or other forms of mechanised and industrial agricultural, including agricultural biotechnology are, however, no less farmers in a way. Neither are agricultural practitioners in indigenous and local communities less involved in plant breeding and other forms of agricultural R&D and incidental innovation. As such, not only is the concept of farming a contested proposition, it is now deployed with assumptions that requires to be unpacked for analytical integrity.

farming and agriculture constitute a cultural process and experience fused with all the complexities of their world views, including ecological and philosophical orientations over humankind's relationship with the natural environment. That bundle of relationships is conceptually navigated through traditional knowledge, a holistic construct that includes but transcends traditional agriculture knowledge and practices. Traditional knowledge is yet again a convenient albeit less accurate expression which does not capture the complex breadth and sophistication involved in the relationships that shape the world view of peoples in their cultural spaces.[22]

In the aspects of the bundle of relationships that undergird farming and agricultural production, sharing and exchange of seeds and other genetic materials and incidental knowledge, as opposed to their proprietary control, is the received wisdom.[23] The predisposition of farmers in ILCs to open model of innovation and knowledge exchange around genetic resources places them in conflict with those whose interests are consolidated through closed and proprietary control.[24] It is less surprising as it is logical for plant breeders and stakeholders in agricultural biotechnology to perceive farmers as free riders who ought to be controlled and reined in through both regulatory containment and even the intellectual property system.[25] But if consideration is given to the fact that ILC farmers have been immemorial curators or custodians of the world's vast genetic heritage and diversity upon which later-day formal plant breeders and hi-tech agricultural R&D thrive, the notion of farmers as free riders becomes a contested charge.

As indicated above, the UPOV remains the most prominent legal framework for reining in farmers. It is an instrument designed to protect the interest

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[22] Indigenous peoples and local communities and others who are associated with indigenous, traditional knowledge or alternative knowledge forms are reluctant to sanction the tendency to compartmentalise knowledge into categories that do not align fully with their world views, experiences and understanding of phenomena. This explains, in part, why defining these knowledge categories remains a work in progress as it is elusive. Available definitions, for example, as broached by the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional knowledge and Folklore (Traditional Cultural Expression), are limited to the specific contexts in which definition is sought. *See*, Chidi Oguamanam, "Wandering Footloose: Traditional Knowledge and the Public Domain Revisited", Journal of World Intellectual Property 1-20 (2018); <https://doi.org/10.1111/jwip.12096>.

[23] *See*, Jaci Van Niekerk & Rachel Wynberg, "Traditional Seed and Exchange Systems Cement Social Relations and Provide Safety Net: A Case Study from KwaZulu-Natal, South Africa", 41 Agro Ecology and Sustainable Food Systems 1099-1123 (2017); *see also*, Roy Ellen & Simon Platten, "The Social Life of Seeds: The Role of Network of Relationship in the Dispersal and Cultural Selection of Gerplasm", 17 Journal of the Royal Anthropology Institute 563-584 (2011).

[24] *See*, Oguamanam, *supra* note 20.

[25] *See*,Borowiak, *supra* note 20.

of plant breeders and, arguably, at the expense of farmers. Historically, the Union is an exclusive and elitist club of European countries and conceivably a symbol of their head start in plant breeding.[26] It is the first international instrument for the protection of plant breeders. It is not as if Europe did not practice traditional farming and the culture of seed saving and exchange in the likeness currently sustained in indigenous and local communities in Africa, India and elsewhere in the global south.[27] Even presently, in parts of Europe and North America, there are still remnants of traditional farming communities including smallholder indigenous farming populations involved in traditional farming practices.[28]

However, the transformations in agriculture in Europe and the New World, notably the United States, reflect the rise in proprietary plant breeding and cognate agricultural R&D innovations. In addition, recently, private sector-driven R&D and innovation in agricultural biotechnology, including various forms of genetic modification continue to pressure indigenous and local community farmers into retreat, possibly extinction.[29] In many industrialised societies, family or smallholder farmers are fast-disappearing into nostalgic vestiges of a romantic past. Clearly, traditional, smallholder historic family farmers are 'endangered species' in Europe and North America and other industrialised regions. From over 60% in 1900s, today less than 2% of the population of those regions are involved in agriculture on a corporate industrial organisational scale.[30] Industrial agriculture has since assumed transnational tenor, leveraging the global free market, penetrating and shaping its legal architecture[31] in a similar manner that transnational big pharma captured the pharmaceutical patent and regulatory regime complex.[32] With an overreach in the global south, transnational industry agriculture is now a present and disruptive threat to the traditional agricultural

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[26] Dutfield, *supra* note 7; Oguamanam, *supra* note 5.

[27] *See*, Bruno Losch, "Family Farming: At the Core of World's Agricultural History", in *Family Farming and the Worlds to Come* 13-36 (2015); *See* generally, Mark B. Tauger, Agriculture in World History (2011).

[28] *See*, John Ikerd, "Family Farms of North America", Working Paper #152 Food and Agriculture Organization of the United Nations and International Policy Centre for Inclusive Growth of the United Nations Development Program (2016), <http://www.ipc-undp.org/pub/eng/WP152_Family_farms_of_North_America.pdf>.

[29] Chidi Oguamanam, "Tension on the Farm Fields: The Death of Traditional Agriculture", 27 Bulletin of Science Technology & Society 260-273 (2007).

[30] For a sampler, *See* Bruce Gardner, *U.S. Agriculture in the Twentieth Century*, EH.Net, <https://eh.net/encyclopedia/u-s-agriculture-in-the-twentieth-century/>.

[31] *See*, Richard Manning, *Against the Grain: How Agriculture Has Hijacked Civilization* (2005).

[32] *See*, Robin Feldman & Evan Frondorf, *Drug Wars: How Big Pharma Raises Prices and Keeps Generics off the Market* (2017).

heritage of indigenous and local communities of the global south,[33] including Africa and India, a development that has ramification for food security as explored in part III below.

B. Smallholder Farmers: Bedrock of Agriculture in Africa and India

Quite unlike the agricultural dynamic and stakeholder profile in the industrialised countries alluded to above, in many countries of the global south, including those of Africa and India, smallholder farmers (mainly women) steeped in traditional agriculture and practices, including seed saving and exchange, produce over 80% of food for the world's hungry.[34] Between 60-80% of the populations in those countries are involved in farming and agriculture which has the combined effect as the highest sectoral employer of labour in many of those countries.[35] Despite attempts by now discredited development strategy to insist upon the formalisation of the informal sector in the global south,[36] the informal and communal orientation of traditional agricultural practices, like the other segments of the informal sector, reinforces the resilience of that sector. That resilience is, in part, as a result of the status of agriculture as an integral aspect of the complex cultural accoutrement of indigenous peoples and local communities. It is further stoked by the current international campaign and responsive developments on farmers' rights.[37]

A combination of factors provided the impetus for the induction of farmers' right as a fledgling concept,[38] into the international legal lexicon. For the purpose of the conceptual framework and the analytical convenience adopted in this Article, I deliberately shun detailing of those factors save

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[33] Oguamanam, *supra* note 29.

[34] *See*, Smallholders, food security, and the environment, IFAD (2013), <https://www.ifad.org/documents/10180/666cac24-14b6-43c2-876d-9c2d1f01d5dd>.

[35] In Africa, for example, an average of 54% of the working population are employed in the agricultural sector while in many countries (where smallholder farmers hold sway) over 80% of the labour force work in that sector. *See*, Mariama Sow, Figures of the week: Sub-Saharan Africa's labor market in 2017 Brookings (2017), <https://www.brookings.edu/blog/africa-in-focus/2017/01/11/figures-of-the-week-sub-saharan-africas-labor-market-in-2017/>.

[36] See, *The Informal Economy in Developing Nations: Hidden Engine of Innovation*, [Erika Kraemer-Mbula & Sacha Wunsch-Vincent (eds.), 2016]; See also, *African Entrepreneurship: Theory and Reality*, (Anita Spring & Barbara McDade eds., 1998).

[37] *See*, Regine Andersen, "The Farmers' Rights Project - Background Study 1: The History of Farmers' Rights: A Guide to Central Documents and Literature", FNI Report 8/2005 (2005), <https://www.fni.no/publications/the-farmers-rights-project-background-study-1-the-history-of-farmers-rights-a-guide-to-central-documents-and-literature-article749-290.html>.

[38] *Ibid*., *see also*, Borowiak, *supra* note 20.

for mentioning the most relevant few for our purpose. They include the exclusive dedication of the UPOV to plant breeders; its inherent opposition to seed exchange and sharing which is at the core of traditional farming practices; the asymmetrical power dynamics and bully power deployed by the United States and Europe in the proselytisation of plant breeders' rights. That tactics are evident not only in taking plant breeders right outside the voluntary and exclusive club of the UPOV but in extending it to the TRIPS agreement pursuant to section 27(3)(b) mentioned above. The significance of including plant breeders' right in TRIPS is that it leaves all countries, including those that have no formal plant breeding capacity or sub-sector, with little or no option than to provide for PBRs in their domestic laws. This is because membership of the TRIPS agreement is prerequisite to the World Trade Organization (WTO) membership.[39]

Before Trump's unconventional strategy, the WTO fraternity was a guarantor of international market access and unfettered trade relations which is critical for the economic stability of the countries in the global south and north. As if that is not enough, the US and Europe favour the UPOV standard as a preferred *sui generis* form of PBRs for African countries, for India and for countries of the global south. It does not matter that most of these countries are not significant stakeholders in plant breeding. For nearly sixty years, the United States and Europe have supervised progressive strengthening of PBRs and a radical roll back of the influence of farmers in agriculture pursuant to an agricultural vision that optimizes Europe and America's factor endowments and comparative advantages in plant breeding, and various forms R&D-driven innovations in industrial agriculture. As well, through regional trade and bilateral arrangements with countries of the global south, the United States and European countries are not averse to championing what has been referred to the stronger standard of intellectual property protection (so-called TRIPs+) over the minimum outlined in TRIPs.[40] TRIPS+ provides the justification for the prescription of the UPOV standard of PBRs for African countries, India and the global south.

The attempt to globalise plant breeders' rights and to foster a stronger proprietary regime of agricultural knowledge production in societies where

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[39] *See*, Chidi Oguamanam, "Developing Countries and Legal Institutions at the Intersection of Agricultural Biotechnology and Development", in *Handbook on Agriculture, Biotechnology and Development* 230-242 (2014).

[40] Christine Haight Farley, "TRIPS-Plus Trade and Investment Agreements: Why More May be Less for Economic Development", 35 University of Pennsylvania Journal International Law 101-112 (2014); *see also*, Chidi Oguamanam, "Breeding Apples for Oranges: Africa's Misplaced Priority over Plan Breeders' Rights", 18 Journal of World Intellectual Property 165-195 (2015).

indigenous and local community farmers are the pivot of agricultural production and innovation such as Africa and India presents an opportunity for consolidation of interests in the two regions for self-preservation. Surprisingly, however, in their various policy fluctuations on the subject, Africa and India have not been able to forge a synergistic response to preserve their mutual or conjoined interests that naturally crystallise around the concept of farmers' rights.[41] Africa's disposition amounts to the failure of resolve and that of India is one of wobbly leadership. These mixed signals translate to lost opportunity for south-south solidarity for food security.

As a continent, Africa has been mindful of the role of indigenous and local community farmers, especially women, as the bedrock of food production and food security on the continent. Africa insists on a holistic approach to policy making in agriculture as opposed to a fragmented one that creates artificial and preferential division between farmers and breeders.[42] In Africa, farmers are inherently breeders, versed in using crop diversity to adapt to complex ecological dynamics, including climate change for example, even though their method of breeding does not conform to the formal scientific test tube agricultural model. A holistic approach to agriculture, which is associated with indigenous and local communities, links agricultural production to agro-biodiversity, ecological stewardship and environmental sustainability. Africa demonstrates its commitment to that holistic approach by extending its interest in cognate international regimes that help to balance UPOV and TRIPS' hard-edged bias in favour plant breeders and industrial forms of agricultural R&D innovations with ones that are sensitive to traditional models of agricultural production.

C. Agriculture Regime Complex

The current regime complex in agriculture in which the balancing of PBRs or other interests in industrial agriculture are negotiated with other stakes and stakeholders in traditional agricultural production include the UPOV-TRIPS, the Convention on Biological Diversity (CBD) and its Nagoya Protocol on Access and Benefit Sharing (NP-ABS), the International Treaty on Plant Genetic Resources for Food and Agriculture (IT-PGRFA)[43] among

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[41] This trend in Africa and India is not isolated from the trend in the rest of the developing world. *See*, Christoph Antons, "Article 27(3)(B) Trips and Plant Variety Protection in Developing Countries", in *TRIPS Plus 20: From Trade Rules to Market Principles* 390-411 (2016), <https://ssrn.com/abstract=2817628>.

[42] *See*, Preamble, African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources, <http://www.wipo.int/edocs/lexdocs/laws/en/oau/oau001en.pdf>.

[43] *See,* Koffi Dogbevi, "The Sui Generis System of Plant Variety Protection under the TRIPS Agreement: An Empty Promise for Developing Countries", SSRN (2017), <https://papers.

others. As the name implies, the CBD is a dedicated and highly influential international instrument for the conservation of biological diversity.[44] Article 8(j) of the CBD text is perhaps the most revolutionary provision with significant impact on strategic protection of traditional knowledge (including traditional agricultural knowledge and practices) through the model of what has since evolved as access and benefit sharing. It enjoins members to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices".

Article 8(j) of the CBD indirectly captures traditional agricultural knowledge and associated practices, notably those relating to seed sharing and exchange which is invaluable to sustainable biodiversity, including agro-biodiversity. By implication, it requires that those who benefit from that knowledge system (plant breeders and stakeholders in hi-tech agricultural R&D included) through various epistemic scaling up should commit to "equitable sharing of the benefits arising from the utilization of such knowledge and innovations, and practices". ABS is an important balance introduced by the CBD which has since found significant relevance and application in the agriculture regime complex through the IT-PGRFA. ABS has subsequently evolved through a gradual schematised pathway, first within the CBD's ad hoc Working Group on Article 8(j), then the 2002 Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising out of their Utilization,[45] the 2001 IT-PGRFA and, finally, the 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation to the Convention on Biological Diversity;[46] without failing to mention the United Nations Declaration on

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ssrn.com/sol3/papers.cfm?abstract_id=2961801>; *see also*, Keith Aoki, "Seeds of Dispute: Intellectual Property Rights and Agricultural Biodiversity", 3 Golden Gate University Environmental Law Journal 79-160 (2009), <https://digitalcommons.law.ggu.edu/ggu-elj/vol3/iss1/6>; Carlos M. Correa, "Sui Generis Protection for Farmers' Varieties", in *Farmers' Crop Varieties and Farmers' Rights: Challenges in Taxonomy and Law* 154-183 (2015).

[44] Pursuant to Art. 1, the 3 cardinal objectives of the Convention "are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources…"

[45] For text of the Guidelines, *see*, Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, CBD (2002), <https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf>.

[46] For Protocol text, *see*, Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on

the Rights of Indigenous Peoples.[47] All of these instruments directly recognise the contributions of indigenous (peoples) and local communities to innovation in various spheres of knowledge production, including biodiversity conservation and agricultural knowledge production.

Specifically, the IT-PGRFA – the first treaty, strictly called, to implement ABS, is also the first to provide for farmers' rights.[48] The latter designates the recognition of indigenous and local community, indeed, the world's farmers' contributions to the conservation and development of plant genetic resources as the foundation of global agriculture and food production. In furtherance of farmers' rights, the IT-PGRFA prescribes the protection of TK associated with PGRFA, and farmers' entitlement to equitable benefits sharing arising from the utilisation of PGRFA as well as their participation in decision making regarding the conservation and sustainable use of PGRFA.[49] Unequivocally, the IT-PGRFA provides that "Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seeds/propagating material, subject to national laws as appropriate".[50] So, the subtext here is that the application of PBRs and/or patent pursuant to UPOV and TRIPS to protect agricultural knowledge production must be balanced by various considerations outlined in other instruments such as CBD and its inspired treaties and or protocols. Clearly, for African countries and India and, of course, their counterparts in the developing world where TK, agro biodiversity, sustainability and conservation ethics, including the practice of farm-seed saving and exchange are the dominant core of their agricultural knowledge and production, it is necessary as it is logical to put their money where their mouth is. In so doing, they ought to be conscious of the implication of uncritical embrace of UPOV and TRIPS' vision of PBRs and patents in agriculture and its ramification for their food security.[51]

Biological Diversity Text and Annex, CBD (2011), <https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf>.

47 *See*, specifically United Nations Declaration on the Rights of Indigenous Peoples (UNDRIPs), UN Art. 31 (2008), <http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf>.

48 *See*, International Treaty on Plant Genetic Resources for Food and Agriculture (IT-PGRFA), FAO Art. 9 (2009), <http://www.fao.org/3/a-i0510e.pdf>. It is recognised, however, that the International Undertaking on Plant Genetic Resource provided for farmers' rights in exact language as the International Treaty but the Undertaking unlike the treaty is a voluntary and non-binding instrument.

49 For elaborate analysis of the elements of farmer's rights under the International Treaty, *see*, Oguamanam, *supra* note 12.

50 *Supra* note 48, Art. 9.3.

51 *See*, Oguamanam, *supra* note 40; *see also*, Susan Isiko Štrba, "Legal and Institutional Considerations for Plant Variety Protection and Food Security in African Development

D. Africa and India's Response: Two Identical Pathways to Farmers' Rights

In 2000, African countries under the aegis of the then Organization for African Unity, now the African Union, rejected external pressures to adopt the 1991 revisions of the UPOV as the prescribed model of compliance with Article 37.3(b) of the TRIPS agreement.[52] This was in the background of the then diffident campaign by the UPOV to induct the region onto the UPOV '91. The latter is the third and most current revisions of the treaty.[53] It has, as its hallmark, the strongest ever protection for PBRs and the most marginal accommodation for farm seed-saving practices of indigenous and local community farmers. At a time of unprecedented level of R&D in agriculture as evident in the disruptive advent of agricultural biotechnology, including genetic engineering and consequential convergences of transnational agro-corporations not to mention heightened trade liberalisations, the implication of a proprietary and missionary agricultural model that is insensitive to the alternative agricultural system was not lost on African countries. Africa's resistance to the UPOV '91 and its preference for balancing of rights in agricultural innovation and knowledge production through a holistic model that recognises the preeminent role of smallholder indigenous and local community farmers and the practice of seed saving and exchange is epitomised in the adoption by the regional body in 2000 of *the African Model Law on the Protection of the Rights of Local Communities, Farmers, Breeders and for the Regulation of Access to Biological Resources*. Elsewhere, I noted that the model law was an African continental attempt "to leverage on the opportunities offered by the CBD … [through] a holistic approach to biodiversity conservation, breeders' and farmers' rights, traditional knowledge, intellectual property rights, access and benefit sharing over genetic resources, food security and food sovereignty".[54] The African Union was quite unmistaken over the raison d'être for the model law, which was to preserve and not compromise Africa's immemorial communal-based breeding innovations and farming practices. Those practices were perceived to be under the threat of novel forms of externally sponsored commercial breeding innovation that targeted market expansion with little regard to other considerations.

Interestingly, at the same time Africa signaled its opposition to the UPOV '91 version of PBRs as the only TRIPS-compliant model of *sui generis* form of

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Agendas: Solution from WIPO?", 12 Journal of Intellectual Property Law and Practice (2017) 191-205.

[52] *See*, Oguamanam, *supra* note 40.

[53] *See*, Jordens, *supra* note 15.

[54] *See*, Oguamanam, *supra* note 40 at 19.

protection of new plant varieties, India was similarly inclined. Without foraying into the checkered history of India's resistance and response, it suffices to mention that after prolonged negotiation by many stakeholders, in 2001, India enacted the revolutionary Protection of Plant Variety and Farmers' Rights Act (PPVFRA).[55] The Act was a bold move on the part of India, not only as a sub-continental country but also a regional influence in Asia and a credible voice in the global south. Like the African Model Law, the PPVFRA recognises, in a holistic manner, the various roles of farmers *qua* farmers and as breeders and conservers in a balanced relationship with other actors including conventional and institutional plant breeders. Key features of the PPVFRA include the following: i) Farmers' rights to save, use and exchange farm-saved seeds and propagating materials; ii) farmer's proprietary rights over own varieties – i.e. recognition of farmers as breeders; iii) protection of existing varieties – including farmers' varieties, those in public domain and/or subject to common knowledge; (iv) protection over essentially derived varieties; v) right to register new varieties; vi) right to be compensated for use of breeder's variety that fails to perform; vii) right of reward for contribution to conservation; viii) right to benefit sharing; ix) miscellaneous categories of rights, including rights to information regarding claimed or anticipated performance of a breeder's variety; immunity over innocent infringement; right to availability of seeds of third party (breeders)'s proprietary variety; right to free legal services incidental to claims under the Act.[56]

Even though the nature, extent and impact of the Act on farmers' rights in India and generally elsewhere is an ongoing concern for stakeholders,[57] by this Act, India was able to articulate and balance the rights of local farmers in their special national, socio-cultural and economic reality with those of breeders. It is important to note the PPVFRA was enacted before the major international legal instrument to make specific provision on farmer's rights (the 2001 IT-PGRFA) came into force.[58] However, PPVFRA was India's response to concerted pressure following the coming into effect of the TRIPS agreement to bring its laws into compliance with the treaty.[59] The language of PPVFRA on farmers' rights is inspired by the 1983 FAO International Undertaking on the Protection of Plant Genetic Resources for Food and Agriculture, the precursor to the ITPGRFA.[60] The PPVFRA

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[55] *See*, Prabhash Ranjan, "Recent Developments in India's Plant Variety Protection, Seed Regulation and Linkages with UPOV's Proposed Membership", 12 Journal of World Intellectual Property 219-243 (2009).

[56] For comprehensive highlights of the PPVFRA, *see*, Andersen, *supra* note 37.

[57] *Ibid*.; *see also*, Ranjan, *supra* note 55.

[58] The IT-PGRFA was signed in 2001 but it came into effect in 2004.

[59] *See*, Ranjan, *supra* note 55; *see also*, Singh, *supra* note 4.

[60] *See*, *supra* note 11 and accompanying text.

is contextualised in the universe of several laws in India such as National Biodiversity Act, 2002; Seed Bill (2004, 2010); revisions of the 1970 Patent Act via consecutive amendments Acts and even the Geographical Indications of Goods (Registration and Protection) Act, 1999 –all which reflect India's delicate balancing of its national interests in farmer-based agriculture and external pressure for full-blown proprietary approach to agricultural innovation for global trade and market access.[61] Seventeen years after the PPVFRA, India continues to struggle in the balancing of those interests with increased tensions across all cadre of stakeholders, including its robust civil society, rural farming communities, its rapidly growing institutional research and breeding concerns not excluding transnational agricultural corporations interested in penetrating India as a prime and prized agricultural market.

E. Africa's Failure of Resolve, India's Wobbly Leadership

In parallel to the motivations behind the African Model Law and the PPVFRA, the resolve of Africa and India to insist upon the protection of farmers remains shaken and wobbly. Between the early 2000s when the two laws were made and now, both Africa and India have come under multi-pronged pressures by Europe, the United States and their multi-billion-dollar transnational agro-biotech corporations. The latter have not hidden their insistence on the globalisation of the UPOV '91 model of plant breeder's rights. Through a combination of carrot-and-stick in bilateral agreements and regional free trade agreements, they press for the highest standards (TRIP+) of intellectual property rights. In the case of Africa, a 2015 study examined the pattern of response to the pressure by UPOV at specific institutional, regional and select country levels.[62] The study uncovered Africa's failure of resolve and the continent's jettisoning of the 2000 Model of Law. Today, through the following trade and economic blocs: OAPI[63] (African Intellectual Property Organization), the African Regional Intellectual Property Organization (ARIPO)[64] and the Southern African Development Community (SADC), African countries have embraced the UPOV '91 model of PBRs.[65] In the case of OAPI, all members of the economic and trade bloc are now members of the UPOV '91 by virtue of that membership of OAPI. Whereas, in the case of ARIPO, individual member countries have either

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[61] *See,* Ranjan *supra* note 55; *see also*, Ramanna, *infra* note 73.
[62] *See*, Oguamanam, *supra* note 40.
[63] For Organisation Africaine De La Propriété Intellectuelle (for Franchophone Africa).
[64] ARIPO is mostly for Anglophone African countries.
[65] Oguamanam, supra note 40.

concluded or are involved in an ongoing process of entering into the membership of the UPOV'91 taking the cue from the regional body.[66]

India's PPVFRA remains in effect. However, its symbolism as a bold resolve to debunk the erroneous and self-serving view held by the industrialised world that the UPOV is the model for compliance with TRIPS provision of *sui generis* protection of plant variety seems to have waned for a number of reasons. As a matter of ongoing pressure, some of those reasons continue to demonstrate India's dilemma and its wobbly resolve over prioritisation and optimisation of its factor endowment around traditional farmer-driven agricultural production through farmer's rights and associated incentives. A few of those reasons or developments require mentioning. The first is successive revisions of the 1970 India Patent Law to gradually open patent protection to agriculture while preservation exemption to plants and seeds. The second is India's long-drawn-out attempt to review the 1966 Seed Act via the 2004 Seed Bill and its subsequent revision in 2010. On its surface, the Bill was an attempt to bring India's moribund seed regime in tune with the reality of seed industry that is driven by transnational plant breeding and agro-biotechnology stakeholders with strong proprietary inclinations. Even though the Bill preserved farmers' practice of farm seed-saving and exchange, it imposed barriers to the ability of farmers to engage in open commercial seed sales. Subsequent revisions via the 2010 version are unequivocal on its attempt to provide for an accountable commercial seed trade by industrial or formal actors while remaining ambiguous on the status or extent of participation of farmers in the seed trade. Through its checkered history, the Seed Bill evokes skepticism among proponents of farmers' rights who are apprehensive that it has the potential to undermine the PPVFRA and by so doing pave the way for India to become UPOV-compliant as a condition for India's planned accession to the body.[67]

Perhaps the most significant indication of a wobbly resolve by India is the fact that during the checkered process leading up to the enactment of the PPVFRA and in the shadow of the yet-to-be-resolved Seed Bill, India is on record as having indicated its intention to join the UPOV.[68] The implication of India's potential membership of UPOV'91 is the assured erosion of the gains on farmers' rights as symbolised in the PPVFRA. Such conceivable eventuality leaves India in no better position than the majority of African

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[66] *Ibid*.

[67] *See*, generally, Ranjan, *supra* note 55; Ramanna, *infra* note 73; *see also*, Kavitha Kuruganti, "This Seeds Bill Must Go India Together" (2005), <http://indiatogether.org/seedbill-agriculture>; Jagjit Kaure Plahe, "TRIPS Downhill: India's Plant Variety Protection Systems and Implications for Small Farmers", 41 Journal of Contemporary Asia 75-98 (2011).

[68] *Ibid*.

countries who have since abandoned the 2000 Model Law for UPOV'91. A combination of the cloud of UPOV membership that has continued to hang over India and the protracted delay in passing the Seed Bill coupled with sustained reservation over the actual impact of the PPVFRA on farmers only goes to demonstrate the wobbly nature of India's leadership over a sustained resolve to fully seize its factor endowments in farmer-driven or grassroots agriculture to negotiate a balanced and sustainable global agricultural order. The next section explores the ramification of Africa's failure of resolve and India's wobbled leadership on the farmers' right project for food security in Africa and India and by extension the global south.

Part III

I. Farmer-Driven Agriculture: The Food Security Ramification

A. Farmers' Rights: Of Justice, Legal Rights, Culture and Development

On a direct literal impression, the phrase "farmers' rights"[69] locates the concept in the realm of legal rights. But the historical context for its evolution and its textual expression specifically in Article 9 of the IT-PGRFA suggests that farmers' rights are in addition to being a legal construct – some form of counterpoise to breeders' rights – it has overarching social justice significance not to mention the idea of an inclusive approach to knowledge production in agriculture and its ramification for development.[70] Associations of farmers' rights to development have effects and implications for a litany of a wide range of interests usually associated with development, including grassroots empowerment, gender equity, eradication of poverty, and improved and sustainable standard of living and, most importantly, in the present context, food security, to mention the few.[71]

The danger of limiting farmers' rights to the intellectual property construct is that farmers' rights become another layer of knowledge enclosure

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[69] When reference is to the concept, "farmers' rights" is used as singular and when it is to content, it is deployed as plural.

[70] *See*, Borowiak, *supra* note 20; Plahe, *supra* note 67.

[71] Lauren Winter, "Cultivating Farmers' Rights: Reconciling Food Security, Indigenous Agriculture and TRIPS", 43 Vanderbilt Journal of Transnational Law 223-254 (2010); *see also*, Oguamanam, *supra* note 12; Oguamanam, *supra* note 20; Philippe Cullet, "Food security and Intellectual Property Rights in Developing Countries" (2004), <http://www.ruig-gian.org/ressources/Brochure6FoodsecDPI.pdf>.

that stifles circulation and access to vital knowledge.[72] Yet, as evident in the African Model Law and India's PPVFRA, farmers are also involved in agricultural innovations, including breeding new varieties and curating old ones (farmers' varieties and existing varieties) which constitute legitimate subjects of ownership and a basis for the assertion of proprietary interests. But a linear emphasis on the intellectual property ramification of framer's rights creates and promotes tickets of competing legal regimes in agriculture that has the potential to become counterproductive. Such an outcome is one of the concerns expressed over India's PPVFRA.[73] Generally, the nature and the extent to which farmer's rights square up or are analogised to intellectual property rights remain suspect as it is debatable.[74] Those will not detain us here since the interest in exploring farmers' rights implication for food security is one that directly engages the development ramification of farmers' rights more than its import as a quasi-intellectual property of sorts.[75]

In the realm of food security, farmers' rights take on a package of relevance and a universe of meanings within a complex rubric of development and its multifarious components, including but not limited to rural empowerment, poverty eradication, agro-biodiversity and agro-ecological sustainability. Amidst differing perceptions on the content of farmers' rights, early attempt at seeking common understating on the subject identifies it as "central to the fight against poverty"[76] and, by extension, to the realisation of two major UN development charters, namely the moribund Millennium Development Goals (MDGs: 2000-2015) and contemporary Sustainable Development Goals (SDGs: 2015-2030). According to a 2006 study commissioned by the Fridtjof Nansen Institute of Norway, "the aim of developing such rights is not just to privatize more public goods in a similar manner as breeders' rights, but to promote a whole range of concerns of farmers' historical contributions and community and shared knowledge".[77] Given that 75-80 per-

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[72] *See*, Borowiak, *supra* note 20; *see also*, Ranjan, *supra* note 55; Ramanna, *infra* note 73.

[73] *See*, Anitha Ramanna, Farmers' Rights in India: A Case Study, FNI Report 6/2006, 49 (2006), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.730.7117&rep=rep1&type=pdf>.

[74] Oguamanam, *supra* note 12.

[75] It is not suggested that the line between the development and intellectual property ramification of farmers' rights is a clear one. In fact, they are mutually reinforcing if the right balance is struck. For example, farmers' proprietary interest over farmer varieties is a source of economic strength and capable of making farming economically beneficial with positive effect to farmers' standard of living and overall multi-tier effect on the entire community.

[76] *See*, Food and Agriculture Organization of the United Nations (FAO), Implementation of Art. 9 of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture: Farmers' Rights (2007), <http://www.fao.org/3/a-be182e.pdf>, being an Input paper submitted by Norway and Zambia based on the outcome of an informal international consultation on Farmers' Rights held in Lusaka, Zambia, September 2007 at 3.

[77] *See*, Ramanna, *supra* note 73 at 49.

cent of the world most poor (estimated at 1.2 billion) are rural dwellers whose major preoccupation is farming, their interests are central to the wide range of concerns referred to in the immediately preceding sentence.[78]

Farmers' rights are, in a way, an umbrella strategy for rewarding all farmers, especially those in the centres of diversity, for the conservation and sustainable use of crop genetic resources and for maintaining the global genetic pool or reservoir on an in-situ basis. It is premised on the recognition of the interdependent nature of agricultural knowledge systems.[79] It is a way of acknowledging that modern industrial or cutting-edge forms of agricultural R&D innovations are not isolated happenstances. But they build from the contributions of traditional agricultural knowledge of indigenous peoples and local communities who are entitled to expect a fair and decent value from their invaluable endeavours. The itemised elements of farmers' rights pursuant to Article 9 of the IT-PGRFA are, for practical purposes, broad indicators of the reward principles the details of which should lie mainly (rightly or wrongly) with national governments under the treaty framework. As such, rewarding the contribution of farmers does not preclude creating negative obligations against any discriminatory practices that undermine their contributions and consequential benefits. Such will include dissuading the use of proprietary and other legal and technological devices where they undermine the interest of the farmers as they seek to contribute and to benefit from available knowledge in agriculture. It is in this regard that India banned the use of terminator technology in the PPVFRA.[80] Similarly, it is in the same vein that farmers find the prohibition of the practice of saving and exchanging of farm-saved seeds of proprietary varieties under the UPOV and patent law to constitute a serious existential threat to traditional farming as we know it.[81]

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[78] *See*, FAO, *supra* note 76 at 3.

[79] Chidi Oguamanam, "Plant Genetic Resources Interdependence: Re-Integrating Farmers into the Global Food System", in *Food Systems Governance: Challenges for Justice, Equality and Human Rights* 143-162 [Amanda Kennedy & Jonathan Liljeblad, (eds.), 2016].

[80] Technically called genetic use restriction technologies (GURTs), terminator is a genetically engineered model of controlling or limiting the regenerative capacity of specific variety or trait — a form of technology enforcement of proprietary right to seeds. It ensures that farmer's interests in use of specific trait is controlled and that the value of a proprietary seed is limited to the harvest since the resulting seed or harvest could not be viable for the next generation or for return to the farm.

[81] *See*, Borowiak, *supra* note 20; *see also*, Chidi Oguamanam, "Genetic Use Restriction (or Terminator) Technologies (GURTs) in Agricultural Biotechnology: The Limits of Technological Alternative to Intellectual Property", 4 Canadian Journal of Law and Technology 59-76 (2005), <https://ssrn.com/abstract=2308629>.

Informal exchange of farm-saved seeds among farmers is a culturally rooted practice that designates a worldview of communality and collaboration in agricultural knowledge production. It symbolises a core feature of alternative philosophical approach to agriculture vis-à-vis a strictly proprietary model typified by breeders' right. In this alternative model, farmers serve as cultural agents and stewards of agricultural knowledge. In India and Africa, the diversity in the modes of agricultural production, in available genetic resources, including seeds and existing agricultural crops or landraces as well as the diversity in cultural and various forms of agencies associated with farming are the hallmarks of informal agriculture. It is hardly by accident that farmer-driven agriculture is associated with centres of biological diversity which are, correspondingly, centres of ethnic and cultural diversity. Farmer-driven agriculture is a natural guarantor of agro-biodiversity – a critical component of sustainable agriculture.[82]

Farmer-centred agriculture is a cultural as well as an economic process. It is cultural in the sense that farmers grow culturally appropriate or culturally preferred crops, even if those crops do not have global market appeal. By so doing, they exercise control over rural and local food choices in ways that make vulnerable indigenous and local communities depend less on external interests who are mostly the proponents and propagators of plant breeders' rights. This approach is consistent with the idea of food sovereignty which is a component of food security.[83] So much has been said already about the exclusive economic and market considerations that account for the focus of agriculture R&D on a few crops on the basis of their global relevance.[84] This mono-cultural orientation is not concerned with sustaining the endemic crop genetic diversities in rural Africa, India and the rest of the world. Rather, the interests of multinational plant breeding concerns and their local agents in India and Africa that constitute foot soldiers in the converging global agricultural landscape are perceived to be better served when traditional lan-

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[82] I.S. Bisht, et al., "Subsistence Farming, Agrobiodiversity, and Sustainable Agriculture: A Case Study", 38 Agroecology and Sustainable Food Systems 890-912 (2014).

[83] Food Sovereignty refers to the rights of peoples, especially vulnerable rural populations to healthy and culturally appropriate food produced in culturally sensitive and sustainable methods whereof farmers and grassroots have control of their food preferences and agricultural knowledge system. *See*, "Food Sovereignty: Turning the Global Food System Upside Down", Grain (2005), https://www.grain.org/article/entries/491-food-sovereignty-turning-the-global-food-system-upside-down; *see also*, Angelo Rinella & Helen Okoronko, "Food Sovereignty: Processes of Democratisation of the Food Systems and the Right to Food", 17 Revista General de Derecho Público Comparado (2015); for a constructive critical perspective on food security in relation to indigenous peoples, *see*, Kyle White, "Food Sovereignty, Justice and Indigenous Peoples: An Essay on Settler Colonialism and Collective Continuance", in *Oxford Handbook on Food Ethics* [A. Barnhill, T. Doggett, & A. Egan (eds.), 2017].

[84] *See*, Kloppenburg, *supra* note 7; *see also,* Manning, *supra* note 31.

draces are eroded or appropriated and farmers are enticed with proprietary monocultures. The spate of Indian farmer suicides in the 1900s which was associated with their use of proprietary Bt cotton seeds that failed to deliver to the hyped projections of its promoters comes handy.[85] One bright light out of that sad experience is that it helped to amplify some farmer-friendly provisions of the PPVFRA.[86] Recently, the Western African country of Burkina Faso officially abandoned the cultivation of Bt genetically modified (GM) cotton, citing poor quality of the product in a move analysts argue has implications for the future of GM crops in Africa.[87]

Farmers' rights are an emphasis on farmer-driven agriculture. In Africa and India, notwithstanding recent progress in formal agricultural research and development, the dominant model of agricultural production is farmer-driven. The informal seed system, which includes the practice of sharing and exchange of farm-saved seeds, still holds sway. Formal seed supply from the public and private sectors remains at all time low, below 10%, whereas over 80% of farmers rely on informal farm-saved seeds for their seed supply.[88] Despite overt and covert attempts in development narrative to pressure or stampede the informal sector to formalise, in many developing countries of the global south, the informal sector remains a significant driver of economic activity[89] and the key to the food security.

B. Framers' Right and the Food Security Intersection

Amidst hundreds of parallel definitions, a widely shared definition of food security endorsed by the FAO is "the condition in which all people, at all times, have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active

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[85] *See*, Gigesh Thomas & Johan de Tavernier, "Farmer-Suicide in India: Debating the Role of Biotechnology", 13 Life Science Social Policy (2017), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5427059/>; *see also*, Prasidh Raj Singh, "History of Farmers' Suicide in India", (2010), <https://ssrn.com/abstract=1689462>.

[86] Such as farmer's right to seek compensation where the representation made by proprietary seed owner fails.

[87] *See*, Claire Robinson, "Burkina Faso Abandons GM Bt Cotton", (2016), <http://www.gmwatch.org/en/news/latest-news/16677-burkina-faso-abandons-gm-bt-cotton>.

[88] *See*, Ramanna, *supra* note 73.

[89] *See*, Nancy Benjamin et al., "Informal Economy and the World Bank Informal Economy and the World Bank" (2014), <http://documents.worldbank.org/curated/en/416741468332060156/pdf/WPS6888.pdf>; *see also*, Kraemer-Mbula, *supra* note 37; Colin C. Williams, "The Informal Economy as Path to Expanding Opportunities", Centre for Development and Enterprise (2017), <http://www.cde.org.za/wp-content/uploads/2017/08/Colin-Williams-The-informal-economy-as-a-path-to-expanding-opportunities.pdf>.

and healthy life".[90] The 2009 World Food Summit identifies three pillars of food security as availability, access, utilisation, while the FAO added stability – which is a reference to sustainability or stability of the first three pillars of food security. At the moment, the world is currently producing much more food than it needs. About one-third of the food produced globally, which approximates to 1.3 billion tonnes is wasted.[91] Of the over 1 billion hungry people in need of food, over 80% of them are in the developing world, and many of them fall within the rank of indigenous and local communities whose main preoccupation is farming!

The implication of the above dismal statistics is that food security or insecurity is not a factor of food production, but one that engages complex socio-economic and, by extension, cultural dynamics which determine the availability, access and the extent to which food is utilised by those in real need of food in a sustainable manner.[92] For people to have food security, they must be able to have a control over their food choices or preferences which affirms the overlap between food security and food sovereignty. Their ability to access food must be premised on economic and social equity and in a context that preserves their human dignity.[93] For example, a population in a permanent state of dependence on food aid is not food secure even where there is no real threat to the sustainability of the food aid. However, the ability of a distressed population to access food aid as an interventionist and humanitarian matter enhances their food security.[94] Where people are directly or indirectly in a state of permanent dependence on external interests for their food, it is antithetical to food security. A system that is based on external sourcing of food for a vulnerable population is less likely to ensure that food is culturally appropriate, let alone available in a state of human dignity. As well, a state of permanent dependence on another for food which is a logical result where actors other than farmers exercise propitiatory control over genetic resources does not enhance the cause for food security and food sovereignty. Sourcing food by the weak in a globally

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[90] An Introduction to the Basic Concepts of Food Security, FAO (2008), <http://www.fao.org/docrep/013/al936e/al936e00.pdf>.

[91] Save Food: Global Initiative on Food Loss and Waste Reduction, FAO, <http://www.fao.org/save-food/resources/keyfindings/en/>.

[92] *See*, Chidi Oguamanam, "Africa's Food Security in a Broken Global Food System: What Role for Plant Breeders' Rights?" 5 Queen Mary Journal of Intellectual Property 409-429 (2015).

[93] *See*, Nandini Ramanujam & Stephanie Chow, "Towards a Human Dignity Based Approach to Food Security: Lessons from China and India", 11 Frontiers of Law in China 1-23 (2016).

[94] The Food and Agriculture Organization's Annual State of Food and Agriculture for 2006 focused on the intersection between food aid and food security. *See*, The State of Food and Agriculture 2006 (2006), <http://www.fao.org/docrep/009/a0800e/a0800e00.htm>.

fractured food system and its symmetrical socio-economic order is less likely to foster human dignity of the world's poor and hungry. This is so because historically, food has been used a weapon of warfare and political pressure.[95]

For the world's food insecure, most of whom are in the developing countries of Africa, India and the global south, farmer-based agriculture is vital for their food security. The fact that smallholder farmers in these regions also double as the most food insecure locates them in a position of direct beneficiaries of farmers' rights. The realisation of farmer's rights becomes an urgent interventionist development strategy. As a development matter, farmers' right must have a poverty eradication outcome, reversing the perennial impoverishment of farmers which is partly a result of a system in which they are framed as threats to plant breeders and subservient actors in the global political economics of agriculture.[96] When farmers are unfettered in their ability to grow their traditional crops, to experiment with them, to produce new varieties and curate existing ones, they are most likely to have full control of their own food production. As an integral part of the grassroots, farmers are in a position to efficiently navigate the access and utilisation elements of food security. This is so because not only are farmers critical chunk of the world's food insecure, they are also a part of rural socio-economic and cultural ecosystem in which other non-farmer food insecure populations are nested in the agriculture and food value chain.

A situation like the one that currently prevails at the global level in which farmers are pressured to serve as retail outlets for proprietary seeds holders is antithetical to food security. Through aggressive technological control and proprietary rights enforcement, farmers are now akin to vending machines for proprietary product manufacturers (in this case plant breeders or patent holders). Consequently, through unfair seed laws and contracts with seed companies, farmers may have a limited choice of what seeds to plant and when; as they are constrained to use their farm-saved seeds while being staged to rely on proprietary ones.[97] If not for insisting on growing

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[95] As far back as March 31, 1941, the *Time Magazine* dedicated its edition to "War and Peace: Food a Weapon" which explored how Hitler's Nazis and Russia's Stalin used food ingeniously as a political weapon. The same place has been referenced in contemporary political struggles and war situations. *See*, for example, Michael Curtin, "Using Food as a Weapon of War", International Policy Digest, November 27, 2017, <http://intpolicydigest.org/2017/11/27/using-food-as-a-weapon-of-war/>.

[96] *See*, Borowiak, *supra* note 20; *see*, generally Kloppenburg, *supra* note 7, Manning, *supra* note 31.

[97] This form of inequity and unfair contractual relationship between farmers and seed companies is not a reference to conventional farmer seed networks – *see*, for example, Oliver T. Coomes, et al., "Farmer Seed Networks Make a Limited Contribution to Agriculture: Four Common Misconceptions", 56 Food Policy 41-50 (2015). Here, the concern is in relation to the relationship between smallholder farmers and

their traditional landraces and saving and sharing seeds from their harvests, farmers risk being literally and metaphorically franchise operators for few transnational agricultural corporations. But in such a situation, as a significant demographic of the world's food insecure, farmers would lack the socio-economic standing needed to make them food secure. When farmers are under the capture of industrial and proprietary rights holders, the outcome is that there is no guarantee of sustainability which is the fourth pillar of food security. First, there is no basis for sustainability in regard to access, availability and utilisation of food. Second, neither is there ground for sustainability of traditional agricultural knowledge system which is the driver of farmer-centred agriculture. Proprietary seeds come as total packages which prescribe custom agro inputs to be used; when, how, and what conditions farmers should plant, tender and harvest; not to mention other details through which farmers are controlled and placed under the surveillance of breeders and right holders to the proprietary varieties.

In addition to the elements of accessibility, availability, utilisation and sustainability, food security is also considered from a food system approach. I have noted elsewhere that "Essentially, a food system framework seeks to strike a balance between competing knowledge systems in agricultural production. It embraces the essence of agro-biotechnology or industrial agriculture, as well as underscoring the importance of agro-ecological imperatives or traditional systems of agricultural production. A food system approach to food security and hunger eradication grounds the multidisciplinary and critical essence of global political economics of food and agriculture".[98] In that context, it is recognised that farmers' rights are theoretically an agency to realise and integrate traditional agricultural production into the food security equation. Unless farmers' rights and their animating justifications assume urgency and importance in the political economics of agriculture, food security in Africa, India and certainly in the rest of the global south which is home to over 80% of the world's food insecure will be hard to attain.

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transnational agricultural corporations such as Monsanto; *see*, for example Deniza Gertsberg, Monsanto's Ironclad Contract – In Fear of The Dotted Line GMO Journal of Food Safety Politics (2010), <http://gmo-journal.com/2010/01/19/monsantos-ironclad-contract-in-fear-of-the-dotted-line/>; *see also*, La Via Campesina, "Seed laws that Criminalise Farmers: Resistance and Fightback" Grain (2015), <https://www.grain.org/article/entries/5142-seed-laws-that-criminalise-farmers-resistance-and-fightback>.

[98] Oguamanam, *supra* note 92.

II. Conclusion

In Africa and India, smallholder indigenous and local community farmers are the dominant divers of agricultural production and innovation. Ironically, that demographic is the most food insecure, a situation that implicates the inequity of the global political economics of agriculture in which farming as a concept is increasingly contested. Within that rubric, indigenous and local community smallholder farmers as well as respected intergovernmental and non-governmental organizations have since become fierce defenders of farmers' rights. Farmers are pitched against proprietary stakeholders in agriculture, notably plant breeders and converging agro transnational corporations involved in all forms of industrial agriculture, including agricultural biotechnology. These are mainly sponsored by Europe and America. In the process of prosecution and optimisation of their factors endowments and head start in plant breeding and formal R&D innovation in agriculture, Europe and America have cast informal and smallholder farmers and their age-hold open and communal model of agricultural production epitomised by the practice of exchange of farm-saved seeds as objects of regulatory containment designed to secure plant breeders and other related actors.

However, in Africa, India and, certainly, elsewhere in the developing world, despite their marginalisation, smallholder indigenous and local farmers have continued to operate in these traditional centres of genetic diversity, demonstrating the resilience of the informal sector as the engine of cultural and economic activities in the developing world. Over the years, their commitment to epistemic pluralism and to genetic diversity in agricultural production contrasts with more proprietary driven and mono-cultural tenor of industrial agriculture. Farmers' contributions to the curation, preservation and conservation of global genetic diversity not only demonstrate the obligate dependence of knowledge systems in agricultural innovation. As well, it renders imperative the need for equitable legal, even non-legal frameworks for rewarding and empowering farmers' invaluable contributions to agricultural innovation. That framework has since crystallised in the idea of farmers' rights, the detailing of which lies at the intersection of its strict juridical (legal) and development (quasi-legal or downright non-legal) ramifications as it remains a work in progress.

Because farming is the highest sectoral employer of labour and the most intensive informal economic activity, it has direct or indirect effect on everyone in Africa and India. Farmers' rights represent a vital entry point for addressing development gaps and for tackling the food security challenge in the two regions and, unquestionably, in the rest of the developing world. The practice of exchange of farm-saved seeds amongst farmers is at the heart of

farmers' ability to thrive and to double as breeders. This practice is critical to farmer empowerment and to the ability of farmers to produce culturally sensitive food and to exercise control over food choices at cultural and communal levels in ways that enhance the food security of the most vulnerable and most food insecure. Farmers are foot soldiers of food security and food sovereignty. They operate within a global food and agricultural system in which the undergirding political economics is a factor of power dynamic that threatens to relegate farmers into retail or downstream outlets of proprietary rights holders in agriculture. Yet the centrality of farmers in the food and agricultural sector in Africa and India accounts for the resolve with which the African continent and India as sub-continental country (of near equal populations size as Africa) and a credible voice of the global south have championed farmers' rights amidst aggressive attempts by Europe, United States and industrialised countries in general to subject farmers to the whims and caprices of plant breeders and other right holders in agriculture.

Africa and India have conjoined interests in securing the role of farmers in agriculture. Safeguarding of that interest constitutes a strategic and direct approach to tacking food insecurity in Africa and India with ultimate ramification for a universe of issues associated with development and sustainability on the African continent, in India and the rest of the global south. As demonstrated in this article, so far, Africa and India have executed their interest in farmers' rights with some degree of fickleness, evident failure of resolve and wobbly leadership. There are perhaps not many sites of interest convergence and solidarity that compels the urgency for self-preservation in food security and agro-epistemic pluralism for Africa and India than those engaged by farmers' rights. The cultural rootedness and resilience of informal farmer innovation and practices in Africa and India and, of course, among indigenous peoples elsewhere, is a factor of the natural concurrence of genetic diversity with ethnic diversity. It is a unique state of affair that constitutes extraordinary factor endowment and comparative advantage for India and Africa over Europe, United States and the rest of the industrialised world's lineal, industrial and proprietary, even if monoculture, model of agricultural R&D innovation and production.

With a combined population of 2.5 billion[99] (which is 33 percent of the current global population of 7.6 billion) about 70-80 per cent (2 billion) of which are involved at some level in smallholder and informal farming practices, Africa and India are true vestiges of farmer-centred agriculture. Given the acknowledged contributions of farmers to global genetic pool and, by extension, the dependence of modern agriculture R&D innovations on

[99] As of 2017, Africa's population was 1.2 billion while that of India was 1.3 billion.

traditional forms of farmer-centred agriculture, Africa and India are in a far stronger position than they have demonstrated in championing farmers' rights as strategic tool to plug the existing deficits at the logical intersection of food security and development. If Africa and India were to synergise and pull their strengths together in championing farmers' rights, on a global scale of solidarity, they are most likely to leverage or tamper American and Europe's intrepid consolidation of proprietary agro-industrial model at the expense of farmer-driven agriculture with greater credibility than the bravado with which Trumpism threatens to overreach America's historic negotiation advantage. Africa and India are in a position to spearhead the impetus for saving farmer-centred agriculture. Such a commitment in itself is a shortcut to expedite development and food security in those regions. In addition to fast-tracking development, by leading the charge Africa and India are serving their mutual self-interest and self-defence over a world that is running riots with an agricultural and food system that feeds off market-driven and inequitable political economics with an outcome that alienates the global food and agricultural system from concerns about sustainability to genuine and practical consideration for food security and development.

Information About the Journal

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